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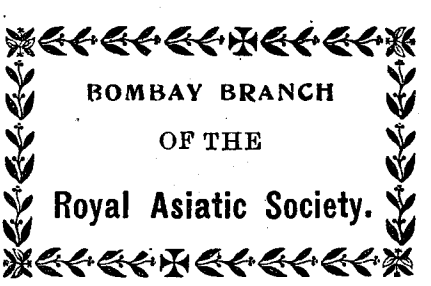

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DEMONSTRATIONS

IN THE MODES OF

HANDLING AND EXAMINING

THE HORSE.

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BY

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To

HIS EXCELLENCY THE RIGHT HONOURABLE

GEORGE ROBERT CANNING, BARON HARRIS, G.C.I.E.,

GOVERNOR OF BOMBAY,

For the warm interest which His Excellency takes in the advancement of Veterinary Science and the untiring zeal evinced by His Excellency in the cause of Scientific and Physical Education among the Natives of the Bombay Presidency,

THIS WORK

IS

WITH HIS EXCELLENCY'S KIND PERMISSION

MOST RESPECTFULLY DEDICATED

BY

The Author.

PREFACE.

It was the intention of the late lamented Prof. J. H. STEEL, first Principal, Bombay Veterinary College, to publish a work on this subject, but owing to his untimely death in 1891, it was not carried out.

In the capacity of a Lecturer at the Bombay Veterinary College, during the last 4 years, the author, having observed that there was a want of such a book on this subject by Veterinary students, has ventured to take it upon himself to make the first attempt to supply the want, although he is well aware that many Veterinary works of a similar nature have appeared from the pens of European writers, there has been very little written upon this subject.

The author, who was a former pupil and latterly a colleague of the late Prof. STEEL, acknowledges his deep debt of gratitude to him, and pays his personal tribute of admiration and respect to the memory of the deceased gentleman, while taking the liberty of making use of his copious notes on this subject, given in the form of Lectures, while at the college.

Also the following works have been referred by the author :—Sidney's Book of the Horse. Stewart's Advice to Purchasers of Horses. Horace Hayes' Points of the Horse, Soundness and age of Horses, and Veterinary Notes for Horse-owners. Goubaux and Barrier's Exterior of the Horse, translated by Harger. Stonehenge's Horse in the Stable and in the Field.

The work owes no small measure of its completeness to the kind and helping hand of Veterinary Capt. J. Mills,

the present Principal of the Bombay Veterinary College, who greatly encouraged the efforts of the author in compiling this work.

To his friend Mr. D. N. Patel, the author's thanks are due for assisting him in correcting the proofs, and getting this work through the press.

In submitting this manual to the public, the author hopes that his first efforts will meet with a favourable reception, especially from Veterinary students, for whom it is mainly intended.

BOMBAY VETERINARY COLLEGE,
Parel, July 1894.

N. D. DHÁKMÁRVÁLÁ.

INTRODUCTION.

For the intelligent handling and knowledge of horses, an elementary acquaintance with the structures and functions of all the parts of the body, is essential. For a complete information on these subjects, the reader is referred to Chauveau's and Strangeway's Veterinary Anatomy, and Prof. Fred. Smith's excellent work on Veterinary Physiology.

Suffice it here to say that the horse, in English, is synonymous with *Equus*, in Latin, and *Caballus*, in Spanish. He belongs to the sub-kingdom *Vertebrata*, class *Mammalia*, tribe *Ungulata*, order *Pachydermata*, family *Solipeda*, and genus *Equus*.

Being a mammal, the horse when young is suckled by its dam, *i.e.* fed on the special secretion (milk) from certain glands termed mammæ, udders or milk-glands. His limbs are characterized by the possession of only one perfect digit or finger (Mono or Perissodactyla), covered by a solid hoof (solidungula), and are devoted to the purpose of progression. In a wild or free state, the horse places his safety in flight, but when compelled to make a stand against any of the larger carnivora, he fights strongly with his heels and teeth. As he is an herbivorous mammal, he feeds on grass (green or dried as hay) and straw or grain. If the usual supply of food be deficient, he may be also fed on camel's milk, as is generally done in Arabia. The only natural paces of the horse are the walk and the gallop; the trot and canter being acquired.

The horse also presents some of the following characteristics of the mammals :—The surface of the body is covered with short hairs; breathing is performed by means of certain organs termed lungs, adapted for bringing atmospheric air into close contact with blood; the

blood is warmer than the surrounding atmosphere; the heart in the adult animal consists of four cavities, two on each side,—one for pumping the blood to the lungs, and the other to the body in general; the young one is born in a high state of development, having long been nourished in the womb of the dam. The period of gestation in the mare being 11 months; the skeleton is strong and somewhat rigid; the muscles of the animal adapt him for swift and prolonged flight in emergency, and for carrying burdens and drawing heavy loads for the advantage of man. The stomach is very simple and partially divided; the intestines are very large and long; and the gall-bladder is absent.

The mule and hinny or jennet are hybrids *i.e.* "crosses" between the horse and the ass. The mule is a produce out of a mare by a jackass. The hinny is out of a female ass by a stallion. The characters presented by these hybrids vary much, being intermediate between those of their parents as regards structure, conformation, liability to disease and otherwise. Both of them respectively "take after" their dam in size; and their sire, in appearance and disposition.

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CHAPTER I.

NAMES OF DIFFERENT PARTS OF THE BODY OF A HORSE.

A horse has two sides, the **Left** or **Near** from which all European horsemen mount, and the **Right** or **Off** side. The front of the body is, sometimes, spoken of as the **Fore-hand** and the back part of the body is called the **Hind-hand.** Some animals, especially mules and asses, are very low in the fore-hand, this must not be confounded with unusual height of the hind-hand, as seen in the celebrated horse Eclipse.

The **Mane** generally lies on the off-side, but in some army horses it is trained to lie on the near-side. In ponies especially the mane is cut off, so that only the upright parts of the long hairs remain, and the appearance resembles that of the ass, zebra and other horse-like animals; and this is termed "**Hogged-mane.**" A thin scanty mane is a sign of good breeding. In the stallion the crest is convex and thick, the result of the presence of a large amount of fibro-fatty substance and is termed the "**Fatty-mane.**"

The body of the horse is divided into 5 parts, *viz.* the **Head, Neck, Trunk or Barrel** and **Fore** and **Hind limbs or extremities.**

Of the **Head,** we distinguish the **Face** or front part; the **Muzzle or Muffle** the lower part; the **Cheeks** or round flat parts at the sides; the **Poll** which is the highest part; the **Jowl** or space between the two cheeks under the jaw, and the **Forehead** between and above the eyes. The long tuft of hair hanging from the poll on to the forehead is called the **Forelock** or **Top-knot.** The head of an Arab horse is characterized by great width of the forehead and jowl, and fineness of the muzzle.

The head shows the following principal openings:— The **Mouth**, two **Nostrils**, two **Eyes** or palpebral fissures, and two **Ears** or external auditory openings.

Of the **Neck** we notice the upper margin called **the Crest**, the long hairs on that margin called the **Mane**, on each side downwards is a furrow running from before backwards called the **Jugular Channel**, on pressing the lower part of which the **Jugular-vein** may be raised; below the channels at the lower part of the neck covered by a thin layer of muscle is the **Wind-pipe** or **Trachea**, with the **Larynx** at its anterior and superior part. Pressure on this causes coughing, which is done to test the soundness of the animal's "**Wind.**" When the neck and head are joined together in a neat and graceful manner characteristic of the Thorough-bred, the animal is said to have his "**Head well set on.**" When the neck is very narrow and small just in front of the shoulder, the neck is said to be "**Badly put on.**"

The Fore-limb commences just below the most projecting part of the spine known as the **Withers.** The upper division of the limb is attached to the side of the trunk and is known as the **Shoulder.** The second segment from before backwards is the **Arm**, and then from above downwards is the **Fore-arm**; below this is the **Knee** corresponding to the human wrist, from the knee downwards extends the **Fore-leg** to the **Fetlock**, between which and the hairy part just above the hoof **(Coronet)** is the **Pastern**, the back of which is the **Hollow of the heel**, and protected on either side by the posterior part of the coronet are the **Heels.** The part of the hoof which can he seen when the foot is on the ground is the **Wall**, and on lifting up the foot and looking at its lower part we see a wedge-shaped part called the **Frog**, also the **Bars** and the **Sole.** Inside each fore-limb just above the knee lies an oval horny excrescence called "**Chesnut**", and at the back of the fetlock, hidden by the mass of long hair which forms

the true fetlock *i. e.* footlock of hair, is seen a little round piece of horn called "**Ergot**". The projecting part of the front of the shoulder is called the **Point of the shoulder**, and the prominence just behind where the shoulder ends and the fore-arm begins is the **Point of the elbow.** Opposite this latter in front is the **Bend of the elbow**, whereas the **Bend of the knee** is posteriorly placed and is commonly spoken of as the **Back of the knee.** Behind the limb from the knee to the fetlock are tendons and ligament situated posteriorly to the bones and are commonly called the "**Back-sinews**", which in the healthy state can be usually seen and felt clearly. They are three in number, one in front is a ligament, and the other two are tendons of the flexor muscles of the foot. The ligament is well known to horsemen as the **Suspensory.** It supports the fetlock and is particularly liable to sprain.

The **Trunk** comprises the **Breast** which is the projecting part between the shoulders in front. It is formed by pectoral muscles covered with skin, which muscles are attached in the middle line to the **Breast-bone** or **Sternum**, the cartilage of which can be felt at the centre of the lower part of the breast forming a prominent ridge. The **Chest** is all that part of the trunk which is bounded by the ribs on either side, the spines above, and the sternum below. Behind it extends to the last rib and in front it is concealed by the mass of the shoulder. The **Girth** is the measurement round the back behind the withers and below the sternum, a little behind the shoulder. It is considered a guide to the breathing powers of the animal and in Arabs and Thorough-breds, this measurement, as taken by the spring-tape, is considerable. A horse is "**Wide in the chest**" when the space between each pair of ribs is considerable and the fore-legs are wide apart as seen from in front at the level of the elbows. A horse is "**Deep in the chest**" when his sternum is at a considerable distance from the back-

bone. A horse is "**Round-chested,**" when the ribs seem much curved. A bad point in the horse is "**Flat-chested**" or "**Flat-sidedness**", when the ribs are very straight, and this is usually an accompaniment of a "**Narrow-chest**", when the two fore-legs at the level of the elbow are close to each other and seem to "**Come out of one hole.**"

The **Belly** or **Abdomen** is the part with soft walls behind the chest reaching as far back as the hind limb. The portion of its wall behind the last rib is called the **Flank**, and ends below in a kind of free fold of skin and muscle, extending to the hind limb against the **Stifle.** A horse is "**Hollow in the flank**" *i.e.* concave behind the last rib, when he is in want of a meal, and a mare when she is pregnant.

When the last rib is near the point of the hip which is the most projecting upper part of the hind limb, the animal is said to be "**Well-ribbed-up.**" When the last ribs are short the animal is called "**Short in the rib.**" If very badly ribbed up, the horse is often spoken of as "**Loosely-coupled**" or "**Slack in the loins.**" A horse, which gives one the impression of being "**Long,**" is best suited for riding work, and a "**Short**" horse, if on stout legs, is often well suited for harness work and remarkable for endurance. A "**Jumped-up**" horse is a short horse on long legs, with little chest and small belly, and is a doubtful one both as regards endurance and power of keeping in useful condition.

Looking below the trunk at the belly in about its centre we find the "**Umbilicus** or **Navel.**" Right at the back we find parts differing in the male and the female. In the male we observe at the centre the **Penis**, called by horsemen the "**Yard,**" it is surrounded by a loose fold of skin called the **Sheath**, from which it may be protruded when necessary. Behind the sheath on either side is a **Testicle**, vulgarly called knacker's stone or kernel, protected by a bag of skin known as the **Scrotum** or **Purse.**

Sometimes however, the testicles have been removed by an operation known as **Castration** or **Gelding**, the scrotum wasted away, and on each side we find a scar indicating the seat of the cut in the operation. By feeling carefully upwards in each scrotum we trace the lower end of the **Spermatic Cord**, as it runs up through the **External abdominal ring** by way of the **Inguinal canal** into the belly. Occasionally small nipples are found one on each side of the sheath, which are especially developed in asses. In the female, the testicles and penis are replaced by the **Mammary** or **Milk-glands** or **Udders**, one on each side, lying together along the middle line, and they are largest in those animals which have suckled young ones, and each bears a small finger-like projection called the **Teat** or **Nipple**, which the young one seizes in drawing out the milk through the holes on its summit. The extreme posterior part of the belly which is situated between the hind legs is termed the **Pelvis**, and it opens at the surface posteriorly beneath the tail. Here we observe the round opening described as like the "mouth of a draw purse" known as the **Anus**, **Fundament** or **Dock**, which is the outlet of the alimentary canal. The skin and part situated below the anus is the **Perinæum**. In the female it is very short and merely extends to as far as the upper angle of the generative opening. In the male it extends downwards and forwards between the hind limbs as far as the scrotum and appears to be bulging in consequence of the presence of the fixed part of the penis. The female generative opening or **Vulvo-urethral fissure** is eliptical in shape, having on each side a **Labium** or lip made up of skin, mucous membrane and muscles. These labia meet above and below to form angles known as the **Commissures**, the upper one is acute, the lower is wider and forms the **Navicular fossa**, in which lies the peculiar little organ called the **Clitoris**, representing the penis of the male. This is commonly exposed when the mare is straining to expel the last

drops of urine and especially when she is "**Horsing**" *i.e.* in the state of **Œstrum** or **Heat**, which comes on periodically when she is willing to accept the stallion. The whole exteral female opening is vulgarily called the "**Shape.**"

The **Tail** is the extreme posterior part of the trunk, which consists of a portion of the back-bone, with its muscles, nerves, blood-vessels, &c., surrounded by skin all of which except the under surface bears hairs of considerable length. The tail is attached to the rest of the body by its **Root** and the manner of attachment is called the "**Setting on**" of the tail, which may be "**High**" or "**Low,**" and when the latter is remarkably the case the horse is described as "**Goose-rumped.**" In well-bred horses the tail is set on high, and in Arabs this organ is carried peculiarly to one side. The "**Carriage of the tail**" has much to do with the elegance and appearance of the animal while moving. Thus when the organ is pressed close against the dock and curved between the hind legs, the animal is expressively described as carrying it "**Like a cur.**" Whereas a tail carried high is described as a "**Flag**" and gives the animal a spirited appearance, which, however, is sometimes merely the result of "**Gingering**" (a piece of ginger having been put into the rectum), and used to be commonly due to the cruel practice of "**Nicking**" or division of the depressor muscle of the tail, which subsequently always remains elevated. This practice is happily gone out of date, but not uncommonly in the present day, horses and especially ponies have their tails "**Docked**" or shortened by amputation of a piece of the free end or "**Tip.**" The term "**Banging**" is applied to cutting the hair of the tail properly. It often improves much the appearance of the horse; but it is fashionable for horses of some breeds such as Arabs to wear the tail long, and all horses used for district work or on campaigns are the better for long tails, by means of which they protect

themselves from flies. In the ass, the long hair of the tail occurs only in tuft about the tip. A horse is said to be "**Bob-Tailed**" when the stump or central part of the organ is short and thick and its hairs are short and scanty. This gives a great appearance of strength to the hind quarters which thus are entirely uncovered by the tail, and the same false indication of increased power is attempted to be produced by docking.

The upper part of the trunk shows us from before backwards along the middle line (1) the **Withers** or prominent anterior part between the upper portions of the shoulder-blade. These are high in Thorough-breds and Australians or Walers, and give the horse increased leverage for the muscles which run to the shoulder and so also extra speed and power. In Arabs and ponies they are low and muscular, in mules and asses generally very low. (2) The **Back** is the part on which the saddle rests. It may be long or short, and curved or hollow when it is called "**Saddle-Back.**" It may be convex, when it is called "**Roached-Back,**" or it may be straight. In a wide-chested horse, the back is also wide. (3) The **Loins** extend from the back of the saddle to the upper part of the hind limb *i.e.* about 1 to 1½ feet, and about ½ a foot on either side of the spine. In roached-back, the loins are convex, which is a frequent state in old animals due to ossification of the loin bones. On either side of the chest is the number of ribs which according to the condition of the animal can be counted. This must be done from behind forwards, as the anterior ribs are concealed from view by the shoulder. The last rib may be the 18th or 19th, in the latter case the horse having what is termed a "**Floating Rib**" on each side. About three-fourths of the way down running to against the elbow-joint is seen a large vein on the walls of the belly, and since it is just about where the heel of the rider may be brought against the side, it is termed the "**Spur-vein**" or external thoracic. The horse has no axilla or armpit.

The **Hind-limb** or **Posterior-extremity** occupies each side of the pelvis or posterior part of the belly. They meet above to form the **Croup** or middle line running from loins to the root of the tail.

This line may be straight as in Arabs and Thoroughbreds, sloping or dropping as marked in Walers and Country-breds, and it may be also long or short. A long high croup is specially a good point in a brood-mare. The wide muscular part below the croup is the **Quarter.** It extends downwards as far as the **Stifle-joint,** which is opposite the lower part of the belly and thus corresponds to the shoulder in the fore-limb, the stifle-joint representing the elbow-joint. The quarter from the croup runs outwards for a certain distance, and then from three prominent points passes downwards. These three points are (1) **Point of the hip.** (2) the **Round bone** or **Trochanter major.** (3) **Point of the Haunch, Tuber Ischii** or **Haunch.** The latter is posteriorly placed, it is occasionally flattened by fracture of the process of the bone. The so-called "**Round-bone**" is only a large process of the Femur or Thigh-bone, which, Farriers in pre-veterinary days used to think, was a distinct part of the skeleton. It must be remembered that this projection indicates the position of the hip-joint, which as well as the trochanter is frequently the seat of disease.

The **Point of the hip** when unusually large and prominent renders a horse "**Ragged-hipped,**" which is an excellent point in a hunter, and the opposite condition is termed "**Flat in the quarter.**" This prominence is the antero-inferior spinous process of the Ilium, which is sometimes broken off and displaced. After this accident the quarter has a peculiar flat appearance, and when seen from behind, looks much smaller than the other, and the animal is said to be "**Down in the hip**" or "**To have a hip down.**" This does not always cause lameness. The supero-posterior spinous process of the Ilium forms the

projecting anterior part of the croup, sometimes it is very large and so gives a false appearance of drooping to the croup, and sometimes it (or the bone which supports it *i.e.* sacrum) is broken, and when seen from behind the two prominences are distinctly unequal in height. Seen from behind the two hind limbs will be found to run together and meet at what is called the "**Fork.**" The muscular part from the stifle to the hock is the **Gaskins** or **Second thigh,** and towards the front of its upper part are glands very liable to abscesses, which show the position of the **Groin.** The joints of the hind limb correspond to those of the leg of man. Thus the stifle-joint is the representative of the knee of the human being and its point is formed by the patella or knee-pan, also called the sesamoid bone of the stifle, and rather liable to be dislocated. The **Hock** represents the human ankle, and its point the prominence of the heel. The fetlock corresponds to the joints at the root of the human toes. Moreover, the hind limb corresponds to the fore in general arrangement, but differs in detail, thus we have seen the quarter corresponds to the shoulder, and the stifle to the elbow. Also it is evident even on slight inspection that the hind-limb below the hock differs only in very minor details from the fore-limb below the knee. The hock evidently resembles the knee, and the part of the limb between it and the stifle termed the lower **Thigh** is in many respects like the fore-arm. The thigh consists of two bones with muscles surrounding them, and further back are the "**Hamstring Tendons**" or "**Tendo Achillis**" which run to the point of the hock. These tendons are prominent, and division of them, so as to disable horses and render them useless, is termed "**Houghing**" or "**Ham-strung**". The great muscles of the quarter run down to both the inner and the outer side of the thigh below the stifle, and when they extend far down, and the gastrocnemii muscles (those of which the ham-strings are tendons) are large, the animal is said to be "**Well let-down.**" When the thighs converge, so that the hocks lie

rather close to one another and the legs incline outwards, the animal is "**Cat or cow-hocked.**" The **Hocks** are complex-joints consisting of two rows of bones forming the upper **Tibio-tarsal** or true hock-joint, where free hinge-like movements occur between the thigh and the hock; the **Tarsal** gliding joints between the small hock bones, and the **Tarso-metatarsal** gliding joints between the metatarsal and small bones of the lower row of the hock. We speak of the "**Bend**" of the hock in front, the "**Point**" behind and above, the seat of "**Curb**" behind and below, at the inner surface superiorly we notice the **Malleolous** or most prominent part of the tibia, the seat of "**Bog-spavin**" being at the supero-internal part of the bend, and the seat of "**Spavin**" at the antero-internal and inferior part. Over this latter runs a vein, passing obliquely over the inner side of the thigh between the skin and the bone (which here is not covered by muscle and is very liable to fracture from kicks). This vein is the "**Saphena**" at which bleeding is sometimes performed and at its commencement it is occasionally varicose (enlarged), the condition being known as "**Blood-Spavin.**" Inside the hock is a small piece of horn called the "**Wart**" or "**Castor,**" which is not found in animals of the ass tribe, and it corresponds to the chestnut on the fore-limb. An animal may be "**Tied in below the hock**" just as below the knee. The distance from hock to fetlock is more than from knee to fetlock; the pasterns in the hind-limbs are shorter and more upright than those of the fore-limbs. The hind-feet are more upright, smaller and narrower at the quarter, and also more hollow on the ground surface with smaller frogs. The ergot is less frequently present on the hind fetlocks than in the fore. A horse which has legs disproportionately long is said to be "**Leggy**" or "**Long in the legs**", and sometimes he is said to "**Show too much daylight.**" A short legged horse is considered good for hardihood and endurance, and is generally "**Stout in the limb**" and "**Thick-set.**" Some horses are disproportionately large in the hind-hand, a point which is favourable to speed but

rendering the animal liable to over-reach, to girth-gall and to shifting of the saddle forwards. Mules are generally low in the fore-hand. When a horse habitually stands with the hind legs far back, he is said to "**Cover a lot of ground.**" Fast trotters and good jumpers have sometimes the hind-feet well under the body and the hocks consequently "**Sickle-shaped**" *i.e.* curved forwards at the front from the stifle to fetlocks. An upright condition of the fetlocks, whereby the joints bulge forwards and are situated above the coronet rather than above and behind, is termed "**Overshot**" or "**Knuckling over**" of the fetlock or in America it is called "**Stockyness.**" It is a result of wear and tear and detrimental to horses for harness purposes.

CHAPTER II.

THE METHODS OF HANDLING THE DIFFERENT PARTS OF THE BODY.

The following are good general rules in handling the parts of a horse :—

(1.) Do all you have to do quietly and without any jerkiness or fuss.

(2.) Learn the work-man-like manner in which horses should be handled and which they are not likely to be accustomed to ; practise it as much as possible and invariably adopt it.

(3.) Never lose your head either through anger or fear with a horse, approach him boldly and and confidently but with proper precautions in case of an unknown horse, and thoroughly prepared for any bad behaviour or tricks.

(4.) Manage a horse by tact, because his brute power is greater than yours, and hitting him about the head with the fist, and kicking him on the ribs or otherwise abusing him are simply calculated to get his temper up.

(5.) Never "lose or chance" with a horse, *i.e.* put yourself unnecessarily into position of danger, or get into a position while handling a horse from which you cannot readily move, such as kneeling down to feel a leg or standing within reach of the heels. To handle a horse without full precaution is un-horse-man-like.

(6.) Always approach a horse on the near side, unless there is a good reason to be contrary, such as blindness of the left eye.

(7.) When on the near side, feel the front of the limb while facing forwards with the right hand, and

all back parts while facing backwards with the left hand, and *vice versa* on the off-side.

(8.) There is a right way and a wrong way of doing anything connected with horses, and the former must be practised until by use it becomes instinctive. Proper horse-handling must be constantly adopted and not simply resorted to on occasions when considered judicious.

A horse's means of offencing and defencing are :—

(1.) By means of his teeth, used for biting purposes.

(2.) The fore-limbs used for hitting or striking, either one or both at a time by rearing or pawing.

(3.) The hind limbs used for striking forwards **(Cow-kick)** or for striking backwards (kicking) either with one foot at a time or simultaneously.

(4.) Trampling or Treading on offending objects with one or more feet, this is sometimes combined with the side movement called "**Closing in on one.**"

Thus it is necessary, firstly to secure the head properly, this may be done :—

(1). By holding it with one hand, grasping the forelock, and other hand resting on the nose.

(2.) By putting on a plain snaffle and having it held by a man who should hold the loop of the reins in one hand, while he either stands in front of the horse holding a rein in each hand, against the rings of the bridle; or standing close to one side, he holds both reins in his unoccupied hand against the lower lip in such a way that he can slide his hand up and down the reins as required.

(3.) A wooden gag may be used instead of the snaffle in the case of notorious biters, or a muzzle put on.

(4.) The head may be tied up and the rope or chain drawn short.

(5.) A side rod may be used. It is a short rod secured at one end to the ring of the bit and the other to a collar-string.

The **Blinds** or **Blinkers** are a useful means of cowing a horse and preventing him being able to see sufficiently to do mischief such as striking or biting. They are generally made of leather or canvas, and must be put on as follows :—

The poll-strap having been fastened, the blinds are brought along the crest and dropped on to the eyes over the poll. The throat-lash is then promptly fastened.

A **Head-collar** with blinkers may be used when the blinds are not to hand, or a simple cloth passed over the eyes and fixed on each side to the cheek-piece of the bridle.

Protection from treading or striking with the fore-limb is afforded by having the "**Fore-foot held up**", a precaution which should always be adopted before feeling the corresponding hind-limb, as the horse cannot stand on two legs of one side, only he keeps his second hind-foot on the ground when one fore-foot is raised, which thus prevents kicking. The foot is held up as follows :—An assistant facing backwards grasps the limb from behind either just above or below the fetlock and then lifts it from the ground bending it fully at the knee, and finally standing at attention looking backwards with the hand nearest to the horse, holding the front of the hoof lengthways. The fore-foot may be tied up either according to **Rarey's** method by means of a proper strap, or a rope forming two loops in figure of eight, one round the fore-arm, the other round the pastern or (since a horse with his leg thus tied if he falls, is very liable to break his knee because the skin is tense) by a rope fastened round the pastern and tied to the lower part of the **Surcingle**. Sometimes

the foot is held up by a rope from the pastern running through the lower part of a Surcingle or else through a ring on the Surcingle. The loose end of the rope is held by an assistant, but by this arrangement the horse has to bear his own weight. When a horse is very much determined in his efforts to strike with his fore-feet, **Hobbles** may be put on each fore and one hind pastern, and the three connected by a **T** shaped rope or chain.

Kicking may be prevented by :—(1.) A single side-line. (2.) A double side-line. (3.) A simple shackle.

A hind-foot should be lifted as follows :—The near foot with the left hand placed in front of the fetlock thumb outside, when pressure is thus applied backwards, most horses will allow the foot to be lifted and placed as the blacksmith does on the left knee, the fetlock resting on the thigh. The foot should be brought well back before being rested, otherwise too great weight will fall on the man. The left elbow may now be brought behind and inside the leg, and the left hand made to support the front of the hoof. The off-hind foot must be lifted with the right hand and put on the right knee. Putting down the foot is the exact reverse process, but the man should be careful to get his foot well out of the way and the hand should not be taken from in front of the fetlock until the foot is well on the ground.

The following methods are adopted with horses which will not allow the hind feet to be lifted in the ordinary way, or which throw their weight too much on the man :—

(1.) Passing a heel-rope over a beam and holding it up.

(2.) Tail passed under the pastern and supporting the foot with it.

(3.) Throwing the animal down when very troublesome.

Care, perseverance, and determination generally render the more severe methods of dealing with such cases unne-

cessary. Horses are seldom troublesome through vice pure and simple, but either they do not understand what is expected of them or they are terrified at the novelty, or they associate it with pain previously experienced. The **Cow-kick** or a kind of rotation of the hind limb outwards and forwards is especially seen in certain varieties of horses notably the walers, some of them being able to strike forwards as far as the outer side of the shoulder, a fact which must not be forgotten while feeling their back-sinews, or auscultating their chests.

The following are the safe plans to stand against a horse :—(1.) Close to the shoulder with a hand against the shoulder to prevent the horse closing in on you. (2.) Close to the hind-limb standing level with the quarter and with a hand on the round bone to prevent closing in.

"**To walk round**" a horse :—One should never walk straight up to a horse and suddenly seize a fetlock or any lower part of a limb. When anything has to be done with a horse, we should walk up to the near shoulder. From this we should work up to whatever part we wish to handle, forward towards the head, down the front of the limb towards the fore-foot ; along the back, loins, and quarter, to the hind-limb, stroking the animal and making much of him by talking or otherwise, as though in the act of grooming. The slight extra time spent on these preliminary endearments is not lost, for it generally secures prompt and immediate obedience to our requirements.

There are 3 ways of "**Going round**" a horse from one side to the other :—

(1.) In front of him, well out of the way of his teeth and fore-feet.

(2.) Behind him, well out of the way of his hind feet.

(8.) On each side of the animal, looking the parts in profile.

We may summarise the **System to be adopted in thoroughly handling a horse** so as to feel the various parts of his body as follows :—Approach his near shoulder, the animal being held by a groom by means of a simple snaffle. Examine with your eye and hand the near side of the neck, not forgetting to "**Raise**" the jugular vein; feel the poll, parotid region, jowl, and pulse, of which take a few beats. Then examine from above downwards the left side of the face. See that the two sides of the face are alike in expression and conformation, look into the nostrils, then open the mouth and examine the front teeth. Next look at the inside of the mouth and back teeth. Then examine the off-side of the face and neck in the same way. Then walk round to the near-side and examine the upper line of the body from poll to the tail. After this the near-fore limb must be carefully felt in its different parts, at first down the front from point of the shoulder to front of the hoof, afterwards down the back from point of the elbow to the heels. The foot should then be lifted and its ground surface examined. The **Wall** should in front form an angle of 45° to 50° with the ground.

On completing the examination of the hoof, the near-fore-foot is handed to an assistant, and the side and lower part of the chest are examined with eyes and hand. Then the external generative organs must be carefully manipulated if the animal is a male. Any appearance of dirt, abrasion, discharge or swelling about the penis and sheath must be most carefully examined, and in cases where there is the least ground for suspicion, the penis should be "drawn" *i.e.* brought out from its sheath. Each testicle should be felt in turn and its cord traced upwards to the external abdominal ring through which it enters the belly. For this manipulation, the examiner should stand against the left shoulder and rest his left hand with pressure on the loins

to prevent the animal "closing in," and to inform early of any movement being made by the animal. In the mare, the mammary glands and the teats may be felt in the same way. The respiratory acts at the flank should be observed carefully but promptly at this stage. This completed, the right hand is placed on the point of the hip and the examiner faces forward, and proceeds from the round-bone down the front of the near-hind limb. On reaching the front of the hoof, he turns round and examines the back of the near-hind from the croup downwards, ending up by lifting the hind foot to examine it as he did that of the fore-limb. It must be remembered that the stifle must be handled gently and carefully ; indeed in the majority of cases it does not require any manipulation at all, because disease of it can be at once seen or detected by the action of the animal ; few horses will stand quiet while the stifle is being pulled about, especially in a rough work-man-like manner. In examining each limb, we must not omit to look at or feel if necessary, the inner side of the corresponding limb, especially the knee, hock, fetlock and foot.

Having put down the hind foot, we should lift up the tail and look at the anus, vulvo-vaginal opening (in the female) and the perinæum. Then pass to the off-hind limb and examine it in detail, first with the right hand along its posterior part, then (having turned round so as to face forward) with the left hand along its anterior aspect. It must not be forgotten to have the near-fore foot dropped and the off-fore lifted as soon as we commence to feel the off-hind limb. From the hind limb we work forward in the reverse direction to that adopted on the near side, *i. e.* working from behind forward, but always in feeling the limbs from above downwards. From the off-side it is, however, not necessary to handle the scrotum or mammary gland, but we should not neglect to look at these parts. On reaching the front of the off-fore hoof we shall have looked and felt intel-

ligently every external part of the body of the horse. Having done it in a routine manner, we shall make sure of having examined every part, and lookers-on will appreciate our system, except those who are anxious to have defects of the horse unnoticed.

Some Veterinary Surgeons examine the whole of the near-side of the body first, and then the off-side. It matters very little, which method is adopted, as long as it is done systematically.

CHAPTER III.

EXAMINATION OF THE DIFFERENT PARTS OF THE BODY AS TO SOUNDNESS.

We cannot too often repeat the essential value of routine in this process, practised so constantly and invariably as to become instinctive. No examination made by jumping from one part of the horse to the other is complete and effective. The defects that horses may have, are so many and so complete that all the senses should be perfect in an examination as to "**Soundness.**" Experts who pretend to be able to give an opinion without touching the horse, simply by "throwing the eye over him," are not to be trusted. They may, to the ignorant and uninitiated, seem clever in being full confident enough, to base their opinion on the evidence of one sense only, but such opinion is very liable to error. Touch and sight are the senses most valuable for an examiner of horses, but smell (as for detection of thrush, canker, or fœtid discharge from the nostrils or mouth), hearing (as in examination of the "**Wind**" or breathing organs), and even taste are useful faculties, and it is the duty of the examiner to exercise each and every one of these faculties as they may be required in his important duty. The faculties have to be trained to the work, and practice leads to accuracy and expertness.

All parts of the body must be felt over and over again in an order, until their conditions to touch and sight are quite familiar, then the examiner begins to be competent to give an opinion. **But a really good opinion as to soundness necessitates**

(1) Knowledge and practice in handling horses and their different parts.

(2) A knowledge of the surface anatomy of the horse, and of the feel and appearance of the

parts which can be felt or seen through the skin of the living animal.

(3) A knowledge of the frequent changes in the parts as a result of age or wear and tear; of differences which they present according to sex, caste, and other circumstances; and of their normal as contrasted with abnormal conditions.

(4) A knowledge of the most frequent diseases and of those which occasionally occur; the former that they may be specially looked for as they are present so often, the latter that they may not escape notice when they do occur.

(5) A knowledge of the processes of disease, in order that judgment may be arrived at as to the degree and importance of any particular defect found.

(6) A knowledge of the various uses and methods of management of different kinds of horses, in order that the importance or the reverse of all defects may be decided on.

(7) Judgment as to the fractional bearings of each observation.

(8) Experience as to the effects of different defects, and to secure promptitude of opinion and correctness of judgment.

Any man who can bring these requirements to bear on the work is competent to examine a horse as to soundness.

All parts of the body mentioned in the previous chapter are liable to disease or complexity of structure but there are some **Parts which require special manipulations** with a view to detect the seats of disease. Such parts are the **Orifices of the body** (described in the next chapter), the **Channel of the neck**, the **back sinews**, the **hock** and the **foot**. All parts, however, should be examined

intelligently as to their anatomical details, such as looseness of skin, direction of tendons, blood-vessels, nerves, bony prominences, &c.

The channel of the neck is examined by "raising the jugular", which consists in pressing the thumb or fingers in the channel. This is done to enable us to tell whether the animal has been bled, or has had any imflamed condition of the vein. If he has been **Bled**, the mark of the wound will be evident generally at about the centre of the channel, and if the vein is inflamed we shall find that it is **Thickened** along its course and cannot be raised. Inflamed vein is not often seen in the present day, but it is a great objection to a horse with this defect, because the blood cannot freely return from the brain and the animal is unsuited for grazing.

Right at the centre of the lower part of the neck, in very rare cases there may be marks of a wound showing that the wind-pipe was opened (**Tracheotomy**) on account of very severe disease of the throat.

After feeling the neck, the hand is passed on to the Poll, and if the animal has bruised condition of the poll, known as **Poll-evil**, he will not allow us to touch it. Sometimes horses are restive when the poll is touched, because they have been made so by a badly-fitting head-collar, but in all such cases the part should be very carefully examined, and any scar should be considered suspicious, because once an animal that has suffered from poll-evil, is more liable to suffer from it a second time. In feeling the poll, we should also notice if there is any disease of the ear, which is not frequent in the horses, with the exception of a disease called **Lopped-ear** which is due to the wasting of the muscles running from the poll to the ear.

The space behind the jaws should neither be too hollow nor too prominent, an either condition shows disease

of the **Parotid glands**, and may be the result of a bad attack of **Strangles**. Any marks of recent blistering along the throat should be considered suspicious. First feel the **Pulse**, and see if there is any thickness of glands underneath the jaws, such as is found in **Glanders** and **Strangles**. Any moisture below the jaw must be carefully examined. It may be pus from a small abscess or the duct of the parotid gland may be opened and through it saliva flowing, which is termed **Fistula of the parotid duct**, and it results from either an abscess of strangles, or opening of the duct in lancing the abscess. Next notice whether the lower part where the curb-chain rests is enlarged. This may be the result of a tight chain which might even break the jaw.

After feeling the lower part of the jaw, look at the **Eye** and first of all observe whether it has a watery appearance or is wet, or whether the eye-lids are thick or the eye seems sunken. Also see whether the **Haw** projects more than it naturally ought to, and also look at the shape of the eye. A deeply sunken watery rather cloudy eye with a triangular space between the eye-lids, is an indication that the animal has suffered from **Specific ophthalmia**. The eye-lids are sometimes turned inwards and also outwards. (**Entropium** and **Ectropium**). They may have **Tumours** on them, and the upper one especially is liable to be **Torn** as by the animal catching it on the nail in the wall of the stable, or being bitten by another horse. Another accident from which the upper eye-lid suffers is **Paralysis**, the result of a blow on the upper eye-lid, causing either injury of the nerve or a fracture of the ring of the orbit. The **Haw** may be enlarged with tumours growing on it and the tears may trickle over the face, either the consequence of a blocking up of the tear duct, a tube which runs from the eye to the nostrils, or from such disease as catarrh.

If an animal naturally shows much white of the eye, it is generally considered a sign of bad temper. A very small eye-ball deeply sunken in the head is called **Pig eye**. A very prominent and large eye is called **Deer-eye**.

The front transparent part of the eye-ball is called **Cornea**, the coloured part of the eye is the **Iris** and the eliptic opening in it is the **Pupil**. The best means to examine these structures is to let bright sunlight fall full on the front of the eye. The cornea should be as transparent and smooth as a watch-glass, but it is very liable to be opaque. Sometimes the cornea is a little black, which may be quite natural when around the edges, but at any other place, a black spot, however small, is a serious **Unsoundness**. Inside the cornea and in front of the iris there is a quite transparent watery fluid called **Aqueous humour**. Sometimes we find eel-like **Worms** moving about in it in a very lively manner, in other cases small yellow masses of lymph or pus may be seen, showing inflammation (**Conjunctivitis**) and even reddening as a result of injury. **Opacity of the cornea** is of two kinds, first a kind of cloud over the whole transparent part, or else a white-lined spot found in some part of the cornea due to injury such as blow of a whip or a sharp instrument.

The iris is of different colours in different animals. When it has not much colour in it and looks bluish-white, the eye is said "**Wall-eye.**" This is quite natural and must not be mistaken for disease. The healthy iris expands in the dark so that the pupil enlarges, and it contracts in the light so that the pupil in a strong light becomes very small. The **Pupil** is a bluish-black opening through the eye. It is oval in shape in the horse, and above and below it, we see small dark coloured masses of colouring material, those of the upper being larger. They are called **Corpora nigra** or black bodies. We find no such bodies in the eyes of a man. In the horse they are of different size in different animals, sometimes they are so large and ragged as to lead us to consider that they must interfere with the animal's sight. But we should never condemn an animal as unsound on account of this, without there being distinctly other signs of disease in the eye. If some small

pieces seem to have broken off and lie in front of the pupil, the eye is **Unsound**, and the animal is liable to **Shy**. The iris should not be of orange colour nor should there be any white strips hanging from it. We should also see that it is not paralysed, but contracts freely when light falls into the eye, and expands the pupil and keeps its proper oval shape.

Any milk-like or yellow spot into the deeper structures of the eye is called **Cataract**, and is due to opacity of the **Crystalline lens** or of its capsule or of both. This lens lies just behind the pupil.

After seeing that there are no traces of the face having been operated upon (**Trephined**) for **Nasal-gleet**, we next examine the **Nostrils**. First we see that the opening is large and well developed and not the seat of tumours of any kind.

Sometimes there is a pouch of skin of the nostrils full of dirty blackish fluid, and this pouch may be so large as to interfere with breathing. Sometimes the cartilages of the nostrils are very loose in consequence of a wasting of the muscles, and is the cause of a peculiar flapping noise made by the nostrils when galloping, which is called "**High-blowing**". It is not an unsoundness and must not be mistaken for **Roaring**. Occasionally on opening the nostrils, a tumour called **Polypus** is found inside, giving rise to a peculiar roaring sound in breathing, and is a great discomfort to the animal. Also horses are seen with the nose twisted on one side, so that the face when seen from the front is not straight. This is probably due to some accident when the animal is born, and may give rise to roaring with a peculiar sound in breathing which is not quite roaring. We should observe whether there is any **Discharge** from the nostrils, and if there is, what the nature of that discharge is. We should also look at the colour of the **Mucous membrane** and see whether there are any traces of **Ulceration** either actually

present or in the form of scars. The condition of the mucous membrane of the nostrils is also a very good indication of the general health of the animal. The opening of the **Tearduct** should also be looked at and examined, and must not be mistaken for an ulcer.

After examining the nostrils, we notice the condition of the **Lips.** Horses sometimes suffer from paralysis of one side of the face, which is shown by the upper lip being drawn to the unparalysed side. Any torn condition of the lips should also be noticed. Some horses constantly have the lower lip hanging down, which is not an indication of disease, but generally shows that the animal is sluggish and will not work properly. A very important part of the lip to look at is the **Angle of the mouth,** because this is the frequent seat of "**Bursatti**" ulcers. Another position in which these ulcers may be looked for is the inner angle of the eye.

Next the front teeth called **Incisors,** and inside of the mouth must be examined for **Age, Marks** of **Crib-biting** and irregular condition of the teeth. In examining for age it is important to remember that sometimes **Marks** are artificially made on the table surface of the teeth in the hope of making the animal appear younger than he really is. These marks are made with a sharp instrument and afterwards burnt with a hot iron, and the whole process is called "**Bishoping.**" However this does not alter the general appearance of the way in which the teeth meet one another. In old horses, the front teeth meet at an angle; in young horses they form a semi-circle. In mares they form an angle earlier than in horses. The upper incisors should especially be looked at for marks of "**Crib-biting,**" in which the front margin of the table appears to be worn out. Sometimes the incisors do not meet properly, but those of the upper jaw project over those of the lower ones, this condition being called a "**Parrot-mouth.**" Sometimes but less frequently, the lower teeth project beyond the upper, which

is called "**Undershot** or **Underhung.**" These conditions are very frequent in old animals, preventing the animal from grazing. The **Tushes** or **Canines** are either absent or very small in mares, and in stallions they are much larger than in geldings. In old animals they become rounded and smooth, but in young animals they are sharp. The wear is caused by the **Bit.**

Next the tongue should be examined, underneath which are little processes called **Bars,** and in the centre is a fold of mucous membrane called **Frænum linguæ,** which keeps the tongue in position. This should not be torn, and the bars should not be enlarged. The tongue should be carefully examined because it is liable to have marks of biting by the teeth or cut by the bit.

The roof of the mouth has ridges across it called **Bars.** Sometimes the whole roof is swollen and is called **Lampas,** which must not be considered to be a disease nor treated as such, because it is found in all cases of indigestion or cutting of the teeth, and is simply a symptom of disease. Behind the tushes should be examined injuries of the bit, in this place sometimes we find a large sore with a piece of loose bone in it. Next examine the back teeth and inside of the cheeks in the usual way. The back-teeth or **Molars** are sometimes over grown at their edges so as to injure the inside of the cheeks or tongue. The upper teeth become sharp on their outer edges and the lowers on the inner side. These teeth should not be blackened from disease nor separated from each other. Immediately in front of the upper molars are sometimes found very small teeth which might be two in number and are called **Wolf's teeth,** and a very common idea is that they give rise to eye-disease, but this is however a mistake, for they are quite natural and do not give rise to disease. In examining the mouth, its heat, moisture, and the colour of the mucous-membrane should be noticed, because they are valuable indications of the general health of the animal.

The next step in examining as to soundness is to stand right in front of the horse, holding one bridle in each hand, and see that the face is straight, eyes alike in appearance, lips even on each side, and no marks whatever of disease or injury in front of the face.

Next we bring the syce on the near side of the horse, and examine the off-side of the neck and face for any diseases, &c. described on the near side. If the mane hangs on the off-side, turn it to the near-side and see that there is no disease of the skin at its root. **Collar-marks** at the lower part of the neck and front of the shoulder may be also looked for on this side.

Next we walk round the front of the horse and come to the near-fore limb, but before examining this, it is advisable to draw the left hand from along the withers to the tail, and examine for **Saddle-marks**, and also feel along the back for any kind of **Sore-back** as well as scars. Then pass the hand along the loins, pressing it firmly to see whether the animal flinches, which is found in cases of injury to the loins, or when the animal is "**Weak**" or "**Gone in the loins,**" or when there is some disease of the kidneys.

The hand is then passed along the **Croup**, and the **Tail** lifted up and **Anus** or **Dock** examined. In lifting up the tail, we must see that there is proper resistance. If the tail can be lifted up without any trouble, either the muscles of his tail may be parallysed or the animal may be in a weak state. If the tail is difficult to be lifted up and the horse gives a deal of trouble over the business, there may be **Black cancerous** or **Melanotic tumours** underneath the tail or there may be a collection of worms in or around the anus. In looking at the anus, we should observe that in a healthy state it remains firmly closed. In some cases it may be relaxed, due to paralysis of the **Sphincter ani** muscle.

While examining the dock of a mare, we may also rook at her outer urino-generative opening, which is not

frequently the seat of disease, but tumours, wounds or discharge about these parts may attract attention. In cases of doubt, the lips of the opening should be carefully examined.

Next we turn to the near shoulder and commence the examination of the near fore-limb from above downwards, first the front with right hand, with face towards the front of the horse, and then the back of the limb. If the animal is at all troublesome, have the off-fore foot held up. Do not put any weight on the horse while examining or handling him. The **Shoulder** is not a frequent seat of injury or disease. We must first look in front of it for **Tumours, Ulcers** or **Scars** caused by the collar and known as **Collar-galls.** A bad collar-gall renders a horse unsound for harness-work, but may be used for riding purposes. The point of the shoulder must be felt for **Shoulder-slip** or for any enlargement, and from here downwards to the bend of the elbow, the **Flexor-brachii** muscle should be felt. The outer surface of the shoulder is sometimes the seat of wasting of muscles outside the scapula in such a way that instead of the spine of that bone being hidden by the muscles, stands out very prominently. This condition should be distinguished from general wasting of all the muscles of the shoulder which is always present when a horse has been not resting the foot of that limb for a long time on account of some disease of the limb. It is this wasting which makes people so often think that the fore-limb is diseased in the shoulder, when the disease is really in the foot or the fetlock. This is extremely a common mistake, but it must be remembered that for one case where a horse is lame on the shoulder, we shall get twenty where he is lame in the **Foot.** The **Foot** being the most frequent seat of lameness in the fore-limb, and the **Hock** in the hind-limb. The muscles in front of the **Forearm** should be felt for any sign of injury, as they are very seldom the seat of sprain. Then the front of the **Knee**

must be examined with the greatest care for any traces of **Broken knee.** There may be an open joint or a scar, or a tumour or a tight and thickened condition of the skin in front of the knee. It is most important to look for a broken-knee or any signs whatever of this injury, because although many a horse falls down and injures his knee quite by accident as when ridden over rough ground, in nine cases out of ten, an animal falls down as a result of some weakness, or disease, or bad conformation or shape, the fore-leg giving way underneath him. In examining a broken-knee, we should, therefore, carefully see what is the cause of the animal having fallen down, whether he **Brushes** or **Bits** his legs together in any way, whether he crosses his fore-legs and turns his toes out, or whether he has bent legs or any disease of the foot. When a horse has sore condition of the frog of the foot known as **Thrush,** if he treads on a sharp stone he may fall down and injure his knees also. We examine the knee by sight and touch first, we smooth down the hairs over it, and then we look carefully to see if there are any hairs which will not be down properly, and also note if there are any white hairs, which are frequently but not always signs of an injury. Next we feel for a **Scar** or **Thickening** of any kind of the skin and the part underneath it. Besides smoothing the knee-skin from above downwards, we can take between the finger and the thumb a few hairs, and see if they are quite smooth, and the skin free from the parts underneath. The position of a scar is of importance, if it is very low down or on the outer side, it does not matter much and would not be described as a broken-knee, but if it is right in the centre of the front of the knee, it is important as showing that the animal has had sometimes or other a bad fall. It is important also to note the caste or breed of the horse, because Arab horses from the method in which they are trained on a very rough ground when quite young at a gallop, are very liable to have

scars on the knee, so that no horseman thinks much of scars on the knees of Arabs, whereas an English carriage horse or a Waler to be used for hack or carriage purposes might be reduced in value to half its original price by a scar on one of the knees. If a horse has very upright shoulders with his fore-feet rather under his body, look carefully for a broken-knee, because such animals are very liable to fall. Horses that are "**Daisy-trippers**" *i.e.* those which go on toes of fore-feet and raise the feet very little from the ground, are also very liable to come down. An enlargement outside the knee is of very little importance, but a wound, scar or enlargement on inner side of the knee is serious, because it is probably due to the hitting of this part with the hoof of the other fore-limb, being called **Speedy-cutting**, and a bony enlargement on the inner side of the knee is a serious disease, known as **Knee-spavin.** A **Splint** is a disease of the fibrous joint between the small metacarpals or metatarsals or splint-bones and the cannon bone, by which the bones become firmly united by bony materials and generally there is a small bony tumour found in addition. Thus a splint may be situated either on the inner or the outer side of the fore or hind-limb, and may be found so high as to affect the lower joint of the knee, or as low down as the inferior extremity of the splint-bones. The apex of this small bone terminates in a knob, which never, except in disease, become attached to the parent bone. These **Knobs** are very prominent in well-bred horses and should not be mistaken for splints. Splints are of very little importance if they are situated forward; but they may cause lameness and unsoundness in the following ways :—

(1.) When the splint affects the knee-joint (**Knee spavin**).

(2.) When the exostosis is so far back as to rub against or interfere with the action of the back-sinews.

(3.) When the splint is being formed and in an active state of inflammation.

(4.) The tumour may be so large as to be hit by the opposite foot.

If the splint is high up it is worse than a low one, and if far back it is worse than one forward. A splint in a young horse frequently causes severe and prolonged lameness, but a splint in an old horse is seldom of any consequence. Sometimes we find a bony tumour on the cannon bone which generally results from blows and is not of much importance. In race horses we generally find an enlargement all down the front of the cannon bone, which is due to inflammation of the bone and the periosetum covering it. This is of great importance because the animal is thrown out of his training and never likely to be of much use as a race horse again. This is termed **Sore-shins.** We next feel for **Ring-bone** in front, of the fetlock, pastern and coronet. **Ring-bones** are of three kinds:—High, Middle and Low. High ring-bone affects the fetlock-joint, middle affects the pastern-joint, and the low, the pedal or coffin-joint. It is extremely difficult to distinguish between a simple enlargement of the pastern bone and a ring-bone; but an enlargement may be present without lameness or stiffness, whereas ring-bones always cause some difference in the action. In some horses the tendon in front of the fetlock-joint becomes very much thickened and enlarged, and in some cases a low ring-one is shown by a painful swelling of the coronet. The skin at the lower part of the limb is thick and therefore it is difficult to detect small ring-bones, so the two limbs should be carefully compared at the fetlock, pastern and coronet, and this comparison must be made by touch as well as by sight. The most frequent seat of enlargement is at the sides, therefore in examining this part of the limb, we feel inside of the opposite foot and also look for **Sand crack** (Crack in the Hoof.)

The hand must now be put in front of the hoof which may be hot, indicating inflammation, or may be rough with ridges running across it and running together at the toes, which also is a sign of inflammation or fever in the foot, called **Laminitis.** The front of the hoof may be bent on account of concavity from above downwards in which case it may be tapped with a hammer or with fingers, and if it gives a hollow sound we must carefully look for the disease called **Seedy-toe.** This completes the examination of the front of the limb.

We now turn round and commence the examination of the posterior part of the limb. Again feel the withers and start from thence downwards to the elbow, and behind it see if there are any signs of injury to the skin known as **Girth-gall,** a bad injury of the kind may render the animal unsound. Next examine the point of the elbow for tumours called **Capped-elbow.** This looks extremely ugly and generally liable to increase in size and throw the animal out of work. It is not an unsoundness, but should be mentioned in the certificate of examination as to soundness.

Then the **Bend of the knee** should be looked for the condition of the skin. A very dry condition of this part with cracks running across the bend of the knee is called **Mallenders.** It is a very rare condition and results from neglect of slight wounds. A similar condition may be found in the bend of the hock and then is called **Sallenders.** Next we observe whether the knee is unnaturally bent. These bent knees are almost always an indication of wear and hard work, occasionally, however, it is a natural **Comformation.** It is called by horsemen as "**Standing over at the knees**", and results from contraction of a fibrous material at the back of the knee. Sometimes we find exactly the opposite of this condition, in which the horse stands with his "**Knees too far back**"; this is a very bad point. Another common defect is "**Calf-knee,**" *i.e.,*

bent inwards like the knees of a calf. A very important thing to look at in examining the knee is the amount of development of the **Os trapezium,** which is situated postero-externally. When it is large, the muscles of the fore-arm which have their tendons attached to it will also be large, and there will be plenty of room for the large flexor tendons to run behind the knee. A horse is said to be **"Tied in below the knee,"** when the back sinews just below the *os trapezium* and the head of the metacarpals seem very small. It is a bad point and animals with it are liable to have sprains of the back-sinews.

Examination of the back-sinews requires greatest possible care in handling, because they are very liable to sprains, and a horse with a bad sprain of these sinews is said to be **"Broken down."** The two tendons must be felt from behind the knee to the back of the fetlock, they must be firmly pressed between the fingers and the thumb. They lie so closely together that when the foot rests on the ground they can only be separated by pressing a little from side to side. However by lifting up the foot they may be relaxed and felt distinctly. The skin covering these tendons should be freely movable, and each tendon from the knee to the fetlock should be uniform in size and free from any thickening as though it were knotted. However just about midway between the knee and the fetlock, a slight jerking feel under the fingers may be noticed, which is due to a branch of an artery, vein and nerve running across the back of the tendon.

We must then feel the fetlock for any puffy swellings called **Wind-galls.** Similar swellings may be seen about the knees, which are indications of work. The **Suspensory ligament** is well in front of the flexor tendons. It can first be felt on both the inner and outer sides of the splint bones and the fetlock, being divided into two parts about an inch and a half above it. In a healthy condition it is a well marked band and can be very plainly felt.

Its lowest part is most likely to be thickened by a sprain. While examining the fetlock, we have to look for the marks of the operation known as **Neurotomy** *i.e.* **Nerve-cutting** commonly called **Unnerving**, above and rather behind the fetlock on both sides, and also for low neurotomy below the fetlock just against the hollow of the heel on both sides. It is convenient while examining the near-fore to make a practice of looking on the inner side of the off-fore for marks of neurotomy, not only we see a slight scar from this operation, but also a small and painful swelling, where the cut ends of the nerve have united and tumified (**Neuroma**). A horse which has been unnerved in both fore-feet may have an enormous amount of disease going on below the fetlock yet not going lame, because he cannot feel it, but he knocks his feet about and moves with a peculiar action which assists in drawing our attention to the condition of the feet. It may be proved that he has been operated, by passing a pin into the hollow of the heel which will cause him no pain. **Wind-galls** are of two kinds. Those which are hot and hard are of great importance, whereas soft wind-galls with the joint cool and no lameness of the animal, are of little importance. These wind-galls are a dropsical or distended condition of the synovial sacs of the fetlock. They may be due to overwork of the fetlock or to general weakness of the animal or to sprain of the part; in the latter case they are inflamed, which may also cause inflammation of the sesamoid bones and thus incapacitate the animal. On the inner side of the fetlock we should look for **Brushing marks**. They are of great importance, and a great deal of judgment is required in deciding whether they are so or not, because an animal may brush so badly both in harness and saddle as to render him practically useless on account of his liability to fall down. These marks should be carefully distinguished from those of neurotomy, the latter being situated well in the hollow above the fetlock on the inner side.

Now the foot should be taken up in the left hand and the hollow of the heel thoroughly examined, which is sometimes the seat of chapped or cracked condition, and is difficult to cure. This is frequent in rainy than dry season. This place is also a favourite one for "**Bursatti**" ulcers. The heels should also be examined for **Over-reach.** Then the foot should be held in the right hand, and with the fingers and thumb of the left hand the stiffness of the **Lateral cartilages** should be examined, the ossification of which is called **Side-bone.** When a side-bone is very forward, it is apt to be confounded with a low ring-bone. The lower surface of the hoof may now be examined, as to its general shape. In India there is a condition of feet known as **Mule-feet,** such feet are upright both at the wall and the heels, the sole is rather hollow and the frog is generally shrunken. These mule-feet are generally very good ones and hard of the horn, but are liable to **Navicular disease, thrush,** and **sandcrack.** The best feet are neither too wide nor too narrow, neither too upright nor too slanting; the sole being very moderately concave and the frog well developed. A mule-foot is sometimes described as a "**Blocky-foot.**" A foot is said to be **Contracted** when it is drawn together at the heels and the frog is very small. This is a symptom of navicular disease, when it has existed for some time. The two principal diseases of the frog are **Canker** and **Thrush.** Canker is a very soft condition of the horn of the frog and sole with a foul smelling discharge, and it is important because it is generally incurable. Thrush is accompanied by an offensive discharge from the cleft of the frog. It is of little importance but occurs very frequently.

Split-hoof is very common in India. It is a crack extending from the inferior margin of the wall to the coronet. **Sand-crack** is a split of the hoof from above downwards, generally occurring at the inner quarter in the fore limb, and at the toe in the hind.

False-quarter is a longitudinal depression in the wall of the hoof, and is the result of an injury on the coronet. A common bruised condition of the sole is **Corn**, a neglected case of which is followed by **Quittor**, which is a sinus on the coronet extending downwards underneath the horn. The examination of the foot must be completed by removal of the shoe and exploring the foot by means of pincers, hammer, and drawing-knife. When the foot is resting on the ground it may be hammered by steady blows, and from the resulting sound we shall learn whether the wall is hollow (Seedy-toe), or the foot painful. Next the foot is raised and cleansed by means of the knife and rasp (after removal of the shoe). This cleaning consists in removal of dirt and loose horn from the sole and cleft and commissures of the frog by means of the knife, and rasping down the wall. A series of slow taps may then be made by means of the hammer loosely held near the end of the handle; and afterwards compression may be applied to wall and sole opposite each nail-hole by means of pincers used with both hands. Any flinching from pressure or blows, will lead to further examination by means of the drawing knife or searcher for the disease causing the pain. This process is termed **"Searching the foot."** Also the hoofs should be washed with water if they are covered with mud or any other stuff, which is purposely done to hide some disease. This completes the examination of the near fore-limb.

Next the chest and the abdomen should be examined as described in the preceeding chapter.

Then the near hind-limb should be examined commencing from the point of the hip. The upper part of the hind-limb is not liable to very important diseases, but the **Hock** is the seat of several diseases of importance, of these three are commonly known under the name of **Spavin.** (1) **Blood-spavin** is a varicose condition or enlargement of the **Saphena vein**, which lies at the antero-internal part of the

hock. (2) **Bog-spavin** is a dropsy or distended condition of the synovial membrane of the true hock joint *i.e.* that which is formed by the tibia and astragalus. It appears as a soft puffy swelling at the upper and inner part of the hock inclined to the front. (3) **Bone-spavin** is an exostosis or deposition of bone on the inner and lower part of the hock, commencing between the cuneiform medium and the cannon bones or between the two large cuneiform bones. To feel for spavin, the tips of the fingers of the right hand for the near side are brought round the front of the hock, and each prominence of the two hocks over the seat of spavin compared. Hocks differ considerably in prominence here, and some horses have hocks so **Coarse** and even unequal as to render them doubtful, in spite of soundness of action. Walers and Arabs especially give us much trouble in deciding as to their hocks. Practical Veterinary Surgeons generally pass **Coarse hocks,** when they are alike, and where the action is even. The examination of the hocks by touch should be completed by feeling them from behind for enlargement far back; then we should **look for spavin** (1) from the side of each elbow in turn, (2) from between the fore-legs, (3) and from directly behind the animal. In each case all three of these positions should be tried as they give different aspects of the hocks.

The **Points of both the hocks** must be carefully compared in full detail, not dwelling too long on any one point, for first impressions in the comparison are the best. **Capped hock** is a **serous sac** situated at the point of the hock, between the cap of the perforatus tendon and the skin. It is usually the result of blows which are generally self-inflicted. Although its presence detracts from an animal's value, especially, as it may indicate vice, it rarely affects the horse's usefulness, unless the part is inflamed. **Thoroughpin** appears as a swelling just about the point of the hock, and in front of the tendo-achillis. When pressed

with the finger at one side of the hock, it will bulge out with increased prominence on the other side. Hence the name. **Sallenders** like **Mallenders** in the fore limb, is a scaly inflammation of the skin at the bend of the hock, accompanied by cracks and thickening of the part. **Curb** is due to sprain of the calaneo-cuboid ligament, which causes a swelling to appear to the rear of that joint, and about 4 or 5 inches below its point.

An experienced man and a good anatomist are the only good judges of hocks.

The **Hind feet** are much less liable to disease than the fore, the following being the principal differences :—

(1). **Sand-cracks** occur generally at the toes in the hind feet. (2). **Brushing** and **Canker** are more frequent in hind than in fore. (3). **Navicular** disease is practically never seen in hind feet. (4). **Laminitis** is extremely rare in hind feet. (5). **Ring-bone** is probably more frequent in hind than in fore. (6). **Side-bones** are more frequent in fore than in hind.

The following are the principal **Dodges** practised by low class horse-dealers in order to hide the diseases of the feet :—

(1). **Beaning.** When a horse is lame in one foot, in order to make him go level, a piece of iron is put between the shoe and the foot of the sound one.

(2). **Shaping** the Sand-crack with gutta-percha.

(3). Covering the hoof with hoof ointment in order to hide **Brittle-hoof, slight Sand-crack, False-quarter,** and rings round the hoof.

(4). Shoeing with leather in order to lessen the lameness in cases of ring-bone.

(5). Sometimes when a shoulder is wasted from disease, some irritant substances are thrown

over the skin at several places so as to cause the injured shoulder to swell ; or air may be blown in, which is noted by a peculiar crackling of the part.

(6). In the hind limbs sometimes spavins are concealed by a wound made over them, therefore any wound over the seat of spavin should be looked upon with suspicion.

(7). Sometimes the sound hoof is made to look as big as the diseased one by putting caustic underneath the skin and so exciting inflammation.

In learning to examine a horse for soundness, make sure that you distinctly feel and see each and every part of the body for its defect. In the beginning you should take at least two hours to thoroughly examine a horse, but after a time by practice you will be able to examine a horse thoroughly from twenty minutes to half an hour.

CHAPTER IV.

THE ORIFICES OR OPENINGS OF THE BODY, AND THE METHODS OF THEIR EXAMINATION.

The orifices of the body or openings to and from the interior are so important and special in their arrangement as to require particular and detailed notice. Some of these orifices are the ends of the tubes which run through the body for physiological purposes, thus the **Mouth** is the entry into the food canal, and the **Anus** is the way of exit for refuge material from that canal; also the two **Nostrils** are the entries into the breathing or respiratory organs, the only openings through which atmospheric air can pass to and from the lungs in the horse. The opening on the end of the penis in the male, and that below the anus in the female is the means of communication of the urinary and generative passages with the surface. It must be also remembered that there are numerous minute orifices in the skin over all parts of the body, some of which in particular parts attain a considerable size and special duties, *e.g.* the secretion of milk by milk-glands in the case of the mare.

The second use of these orifices is to admit physical influences to act on the special organs of sense, *e.g.* the external auditory or **Ear** canal, and the openings of the **Eye** are solely devoted to special sense; but the **Mouth** is also utilised as the seat of the special sense of taste; the **Nostrils** as organs of smell; the **Urino-genital opening** has something akin to special sense in being the seat of the peculiar sexual sensations and of the feeling of the necessity for urination; and the **Anus** and its parts within are the seat of the feeling of need for defæcation.

The arrangements whereby the functions of sense may be properly performed, are most admirably adapted to the purpose, and where an orifice has to do double duty as

a door-way and as an organ of sense, certain special parts are particularly devoted to the latter duty, *e.g.* the tongue in the mouth is the special organ of taste, and the turbinated bones in the nostrils are special organs of smell. A special advantage resulting from the posting of these senses at the portals of the body is that they are enabled to act instinctively as porters to regulate admission and exclude unfit materials.

The **Ear** as seen from without is found to be a tube running in through the skull bones, at the supero-lateral part of the head and guarded by structures, together forming the external ear. This is a pouch of skin lining the external canal of the ear and covering the cartilages. The skin in the canal is thin especially at its deepest part, it has large glands which secrete the **Cerumen** or **Ear-wax**, and also long hairs which block the passage to protect it from the entry of dust, insects and other foreign bodies. The cartilages of the ear are three, viz. the **Conchal, Annular** and the **Scutiform.** The conchal or shell-like cartilage gives shape to the etxernal ear. It varies much in size, being **Large** and **Coarse** in low-bred horses, asses and mules. In country-bred horses the tip is curled in a peculiar manner. The mobility of the ear is due to the special muscles attached to the skull bones and to the concha, and in horses it is very great, so much so that the ear is appropriately regarded as the **Organ of expression.** The horse is also said to be **"Pricking his ears"**, when he tries to listen anything. Fashion once used to favour the barbarous and foolish custom of **"Cropping"** *i.e.* cutting the ears to suit the taste of the owner, this has happily become obsolete, and now horses are allowed natural exercise of the faculty of hearing. The excessive play of ears in a blind horse, their absence of motion in a deaf animal, their intelligent and beautiful action when the animal is in danger or excited, and their flapping up and

down in a dull, ugly and sluggish horse, are matters familiar to all.

Occasionally, a troublesome horse may be thoroughly cowed down by stuffing his ears so as to deafen him, this is commonly accomplished by putting into each ear a leaden mallet, the two being connected by a string. The external ear is seldom the seat of disease in the horse, but any restlessness when the part is touched should lead to careful examination; it may be possibly due to the animal being familiar with the application of the instrument known as the **Twitch**, which is sometimes put on the external ear. It is a loop of cord about $\frac{2}{3}$ of a foot long fixed on the end of a stout stick. It is applied by holding the stick in the left hand, putting the loop like a bracelet round the right wrist, seizing the ear or the lip to which it is sometimes applied, with the right hand, working the loops over the hand to the root of the ear, then twisting sharply until the loop grasps the ear firmly causing some pain. The objects of a twitch are to divert the animal's attention by a hard and painful sensation from any minor operation to be performed on him, also to cow him down by this exhibition of mastery over him. The twitch being painful, should be used as little as possible, but cannot be absolutely dispensed with. Used brutally it may seriously injure the ear.

The **Annular cartilage** is small imperfect and ring-like, which fits over the bony canal like the joint of a telescope.

The **Scutiform** or **shield-like** cartilage is united to the conchal cartilage by muscles, and lies well in front of it in the region of the temple.

The whole external ear is acted on by muscles which draw it backwards or forwards, and outwards or inwards, as is necessary to catch the waves of sound. When the muscles which erect the ear are paralysed or weak there is want of play of the ear and they hang outwards,

which is familiarly known as **Lop ear.** Little is known on the subject of deafness of the ear of the horse, and no special methods or appliances are as yet adopted for examination of the organs of this sense.

The **Eye** specially requires examination, because good eye-sight is important to all horses and also because diseases of the eye are frequent. In examining as to **Soundness,** there are three chief things to be especially looked at, *viz.* (1) **Eye-sight.** (2) **Wind.** (3) **Limb.** These, with **Freedom from constitutional disease,** being the four headings under which the examination must be conducted. The eye-ball or the organ of sight is situated in a cavity of the skull called **Orbit,** at the supero-posterior part of the face. It is protected by several important parts which secure its freedom from injury and any cause tending to lessen its transparency for admission of the rays of light. These protective organs are the mucous membrane called **Conjunctiva,** the eye-lids and the lachrymal apparatus, all of which should be examined. To these may be added the muscles, which are not visible externally, but the Retractor muscle which is the deepest and strongest of all is important, because it is not found in man; and also that remarkable structure described as the **Haw,** winking membrane (in birds), **third eye-lid** or **Cartilage Nictitans.** This structure is in the horse a piece of cartilage of an irregularly triangular shape connected internally with a sort of cushion of fat which lies behind the eye-ball. Retraction of the eye-ball causes pressure on the fat, which is transmitted to the haw, and mechanically pushes it out to remove from the front of the eye any foreign body which may have alighted there, or to protect it from injury. The haw is covered by the conjunctiva, which after covering the structures of the eye-ball, is continuous with the lining membrane of the lachrymal ducts, above and below through the tear canals it is indirectly

continuous with the membrane lining the nostril. The **eye-lids** are two in number, upper and lower, and they form curtains for covering the front of the eye-ball. The opening between the lids is called the **Palpebral fissure,** which is eliptical, having a nasal or inner canthus or angle, which is obtuse or rounded; and an outer or temporal angle which is acute. An eye which seems deeply sunken in consequence of thickening of the lids is termed a **Pig-eye.** A weak or watery eye is one from which tears constantly trickle.

The mucuous membrane of the eye must be looked at with a view to determine the general condition of the health of the animal. This is done by placing three fingers on the forehead, and by means of the index finger and thumb, the eye-lids are separated by pressure of the index finger on the eye-ball.

To "**Examine an eye**" two stages are necessary. The front of the organ and its various appendages should be looked at in a clear sunlight. The **White of the eye** is formed by the **Sclerotic** coat, and when a horse shows a good deal of it, it is considered a sign of bad temper. The sclerotic is bounded in front by a transparent watch glass-like organ called **Cornea.** The anterior surface of the cornea is covered by a very thin layer of conjunctiva, and on its posterior surface is found the **Anterior chamber** filled with a watery material called **Aqueous humour.** Behind this is the **Iris** which gives colour to the eye, at the centre of which is an ovoid opening called **Pupil.** The iris is of a brown colour, but sometimes it is devoid of colour, so that the eye looks white, and is then termed a **Wall-eye.**

The second stage in examination of the eye is for determination of the condition of the deeper structures of the eye-ball. In cases needing specially careful investigation, the **Ophthalmoscope** is used, but for practical purposes

lm ost invariably the following method suffices :—Bring the animal in a dark place where his pupils will expand to the utmost, and so place him that light will fall on the eye and enable us to see into its depth. The position must be such that we can see clearly and distinctly. A place which answers at one time of the day may not do so at others. We must get a good light, and may generally do so best by facing the animal towards a window high up in the wall of a stable, such as that generally seen above the door. Any want of distinctness in the depths of the eye must be noted, especially any white spot which may obstruct vision. Any opacity behind the pupil is generally a **Cataract**, whereas an opacity of the front of the eye is generally situated on the cornea.

For further examination in the dark room we may adopt the **Catoptric test** :—*viz.* a lighted candle is held before the eye and its reflections looked for. They are three in number:—(1) is from the cornea, and is upright and moves in the same direction as the candle. (2) is from the front of the crystalline lens behind the pupil, it also is upright and moves with the candle. (3) is inverted and moves in the opposite direction of the candle, it is from the posterior surface of the lens and is obscured in cases of cataract more or less completely.

The **Ophthalmoscopic test** for examination of the eye needs a special practice, and is not so often resorted to as to necessitate its detailed notice here. Opacities look like black specks when examined in this way.

In the ordinary course of examination, a small **Black eye board** about six inches in diameter with a handle about the same size, should be used. It prevents reflections from white objects falling into the eye and thus misguiding us in finding out any opacities.

The **Nostril** or anterior nares is situated at the anterior part of the lower extremity of the muzzle. It is

a wide opening having a cartilagenous skeleton and capable of considerable expansion by the action of dilatator muscles. It is lined by skin which is thin and delicate and becomes continuous with the mucous membrane of the nasal chambers, called **Schneiderian** or **Pituitary.** Each nostril is bounded by two wings, the inner and the outer. **Persian horses** often have a scar on the cartilage, where a piece of it is removed with a view to improve on nature's arrangements for admission of air to the lungs. The Arabs fully appreciate the value of large nostrils which should be **"Like the mouth of a roaring lion."** There are number of long hairs, called **Feelers** found about the muzzle of the horse, specially numerous about the nostrils, they are the organs of touch and should not be cut off as is sometimes done. One hand or both can be used for opening the nostril, a fair view of the interior may be obtained by simply resting the fingers of one hand on the nose, and raising the inner wing with the thumb. But a more interior view can be had by drawing the outer wing backwards and outwards with the fingers and thumb of the other hand.

One special feature of importance about the nostril of a horse is the presence of a peculiar pouch of the skin running directly backwards from the opening, and terminating in one (occasionally two) **Cul-de-sacs** or pouches outside the true nostril, running below and behind the long projection known as the nasal peak. This pouch is termed **False nostril.** It is relatively larger in the ass than in the horse, is sometimes full of dry epithelium, and is the part into which a finger directly inserted passes. It is a common practice in India to make a double slit of this pouch in asses, so that the loose flap, lined inside and outside by skin, hangs down in a curious manner. What the exact use of the false nostril is, has never been thoroughly explained, but they probably enlarge the nasal openings during respiratory exretion. On the floor of the

anterior nares is a peculiar little hole as though punched out of the thick skin. This is the **Opening of the tear-duct** which runs from the eye. It must not be mistaken for an ulcer. Sometimes it is double, and in the ass it is generally underneath the inner wing of the nostril, and so at first sight seems to be absent. On opening the nostril wide we can inspect the colour of the mucous membrane, which is an index to the general state of the system, and it is most important in every case to observe whether it shows any signs of derangement. To look still deeper into the nostrils, both wings should be separated, and a small mirror should be used to reflect light into the nasal chambers.

The **Mouth** or oral opening, unlike the eyes, ears and nostrils, is a single one. It lies at the antero-inferior part of the muzzle and is bounded by two movable curtains, the upper and the lower lips. In coarse-bred horses, the upper lip bears rather long hairs which may be quite developed into a moustache ; the lower lip has a prominence centrally, termed the **Chin.** The lips on each side meet to form an angle of the mouth. The lips are delicate touch organs, and in the horse perform the important function of prehension of food, as may be well seen when a horse eats grain off a level surface.

The numerous important organs situated in the mouth can be examined to an extent without appliances. To examine the front of the mouth and especially the incisor teeth for age, and any peculiarities of them, the thick part of the upper lip is grasped firmly by one hand, and the two fingers of the other hand are inserted into the angle of the mouth, and the tongue is kept on the floor of the mouth by being pressed by them, not projecting over the front teeth. The lower lip is prevented from curling up over these teeth by a downward pressure from the thumb of the same hand. Sometimes the mouth is full of food, and sloppy with saliva, which can be got rid off by

allowing the animal to wash his mouth out with a little water. Under no circumstances should the fore-finger be used to clean the surface of the teeth which beginners are very liable to attempt to do. The **Twitch** is sometimes put on the upper lip and occasionally on the lower one, as these parts give a good hold, and having very large nerve, the application of this causes much pain. It is sometimes used simply as a means of holding the horse, but we need not repeat our remarks against the abuse of the twitch; it should be found only in the veterinary pharmacy, and neither in forge nor stable. It is an instrument of coercion to be used in emergency, and not as a matter of routine.

The teeth will be noticed hereafter in detail, suffice it at present to state that they are of three principal kinds, placed on the margin of the upper and lower jaw. Those in front, six above and six below are the **Incisors**, which are arranged in upper and lower series meeting one another evenly at the flat parts which become worn and are known as the **Tables**. A short distance backwards on each side is situated a single tooth, the **Tush** or **Canine-tooth**, which varies much in development according to age, sex, &c. After another gap we find on each side of each jaw six **Molars** arranged in regular series from before backwards. They are also termed from their function **Grinders**, or from their position **Back teeth**. All the teeth are fixed in the jaw firmly, their deep parts are embedded in the bony cavities called **Alveoli** and also by the firm, thick mucous membrane of the mouth grasping them and extending on to the jaw on each side. This portion of the mucous membrane is called **Gum** or **Gingivæ**, but the name given to the mucous membrane of the mouth in general is **Buccal**. The roof of the mouth is formed by the **Hard palate**, which is raised up into ridges called **Bars** running across from side to side, behind this is the **Soft palate** called **Velum pendulum**

palati, which hangs down like a curtain and separates the mouth from the **Pharynx.** It is pushed up when anything is passing from the mouth to the pharynx, and in the horse it is remarkable for being so large that a horse cannot breathe through the mouth, nor can vomition be performed through it. Anything which has once really and fully passed into the pharynx must be expelled if necessary, through the nostrils.

A ready method of examination of the back of the mouth is made by standing in front of the animal, then grasping the front of the tongue more firmly with the hand, drawing it as far forward as possible without actual dragging, and placing it between the back teeth, then turning over the fist which holds the tongue in such a way that it acts as a gag to prevent complete closure of the mouth. The other hand may now be used for lifting the lips and cheek out of the way, and thus the whole of the interior of the mouth can be glanced at rapidly.

But if we observe anything special, or the animal is very troublesome, we must extend our inquiry to feeling the different parts, which may safely be done by means of the **Mouth-speculum** or **Balling-iron,** of which there are several kinds. The best of these is Varnell's sliding balling-iron, the arms of which can be brought together when it is to be put in the mouth, and then gradually moved apart to any required extent by means of a screw below the handle. The arms which rest against the gum are protected by India rubber tubes to prevent excoriation.

To use the Balling-iron, have at hand a bucket of water, turn up your sleeves, have the horse brought out in a halter or plain head-collar, or else have the bit removed from the mouth. Screw the sliding arm to its highest point, then have the tongue drawn out of the mouth on the left side. Holding the handle of the instrument in the left hand, introduce the arms of it into the mouth one at a time, then turn it round so that they press

on the jaws and separate them as the screw below the handle is gradually turned. The instrument is removed by exactly reversing the process, and on removal the mouth should be washed with water. While it is in the mouth, the hand may be passed freely and the structures at the back of the mouth seen, felt clearly, and the hand passed right through the **Isthmus faucium** under the soft palate into the phraynx.

The plain-balling irons are apt to injure the gum, and require to be protected by winding tow round their arms. Useful as the balling-iron is as a mouth-speculum, it is a mistake to have it invariably used in giving a ball—a minor operation which ought to be readily accomplished without such instrument, and unless a student can give a ball without the balling-iron, he should practise it until he can. The left side of the neck at the channel should be watched for "go-downs" of water, medicine, pellets of food, or a ball "go".

One of the greatest of the few advantages which Veterinarians have over human Surgeons in the diagnosis of diseases, is the fact that the anus of the horse is sufficiently large to admit of introduction of the hand and arm for thorough **Examination per rectum.** The terminal portion of the large bowel called the **Rectum** ends by becoming narrow by the contraction of a circular muscle called **Sphincter ani.** This muscle is relaxed when dung is passed and its opposition can be easily overcome by inserting the hand steadily and in a wedge-like manner. A process termed **Backraking** is performed as follows:—The horse's head being fastened, the near-fore foot is held up by an assistant, the tail is held on the off quarter by another assistant; and the explorer will lubricate his right hand and arm with soap or oil, and resting the left hand on the quarter or the point of the hip, he should bring the ends of all fingers and thumb of the right hand together, and steadily with a slight rotatory motion

introduce the hand through the anus. It will probably be found that several handfuls of dung have to be removed before free examination can be made, but a good plan is to empty the rectum by means of an **Enema** before commencing to explore. With care and without hurry the following observation can be made :—Superiorly on the middle line is the large posterior extremity of the **Posterior aorta**, and the beats of the pulse can be plainly counted from this large artery. Another important thing to examine is as to the state of the **Internal abdominal rings** in the stallion. In India and other countries where horses as a rule remain uncastrated, it must be made a rule that in all cases of colic in the stallion, the internal abdominal rings should be first examined for **Hernia.** It is already described how the **External abdominal ring** should be felt. The internal must be searched for by the hand in the rectum well on one side, a little low down and not so far from the anus as might have been anticipated. The different structures of the cord may be traced down to it, and it will readily admit the end of the finger. Any indefiniteness of these parts is suspicious. The hand pressed downwards in the wall, determines the state of fulness or otherwise of the **Bladder.** In the female the **Womb** and the **Vagina** may thus be felt, and pregnancy or the reverse be determined. But it must be remembered that no force of any kind should be exercised in rectal examination, and the operation should be conducted with special care in pregnant mares or those supposed to be so. Anteriorly in health can be felt an indefinite mass of bowels, the single colon being specially distinct as containing dung balls, and the double colon as lying down below and generally containing solid matter. Tumours, collections of dung, stones (calculi), twist of bowel, and the various causes of colic may at times be detected per rectum, and in some cases of ruptured stomach, the solid contents of that organ can be

felt free among the bowels. Neglect of rectal examination in abdominal disorders is most unjustifiable on the part of the Veterinary Surgeon. The state of heat, moisture, and fulness of the rectum is to an extent a guide in diagnosis of diseases, and frequently hernia may be relieved, collections of dung broken down, entangled bowels loosened, and relief otherwise afforded by the hand in the rectum.

Somewhat allied to rectal examination is the **Exploration per vaginum** which can be made in the mare. The greased hand can be introduced without serious opposition, but if the mare " lashes out " with her hind legs, we must put on the double **Side-line**, or hobble the two hind pasterns to one of the fore. About on an average four inches from the lower angle of the outer opening *i.e.* **Vulva**, the finger or the **Female catheter** can be passed through an opening into the **Urethra**, or channel of outlet from the bladder. The cavity of the **Vagina** is much larger and longer than that of the generative opening, and the hand can be freely moved about in it. Through it the rectum can be felt above, the pelvis below and laterally, and the bladder below. At the anterior part on either side the bowels lie against the vagina, but centrally is situated the anus-like orifice of the womb *i.e.* **Os uteri** through which in the non-pregnant animal the finger may be insinuated, but in cases of pregnancy it is very prominent and obstinately closed. That part of the generative passage which extends from the mouth of the womb to the opening of the urinary passage is called the **Vagina**, and from here to the external opening is the **Vulva**. In the virgin animal, these are partially separated from each other by a half moon-shaped fold of mucous membrane called the **Hymen**. When we wish to see the interior of the vagina, the various forms of **Vaginal speculum** are used and a concave mirror to throw in the light. Of the instruments the ordinary duck bill-like speculum is the

simplest and best. The interior of the **Uterus** or **womb** may also be explored by means of an instrument termed the **Uterine sound or explorer.** The **Female catheter** is used for exploring the urethra and removing the contents of the bladder. It is a narrow straight tube about 1½ feet long, made of metal or gum-elastic, having a blunt rounded perforated end for insertion and a funnel-like extremity for exit of urine. The gum-elastic tube is stiffened by means of stillet of whalebone or cane, which can be removed as soon as the instrument is inserted. **To pass the female catheter,** the right hand and the catheter are lubricated, The animal is held as for **Backraking,** the right fore-finger is put on the rounded end of the catheter and the instrument held under the palm of the hand. The fore-finger is now passed steadily along the floor of the vulva, until the urethral orifice grasped by a kind of valve of mucous membrane is felt, then the end of the catheter is introduced into the orifice and passed onwards by pressure from behind into the bladder, and as soon as any resistence is experienced or when it has been passed in the necessary depth, the stillet is withdrawn. The gum-elastic catheter is the cleanest and most convenient, but the metal one is most suitable for rough service, neither being acted upon by heat nor liable to break, and it is best for exploring for stone in the bladder, which, however is not common in the female. It requires to be warmed before insertion, otherwise its coldness may cause contraction of the muscular fibres of the parts with which it comes in contact.

The **Male urino-generative opening** is that situated at the end of the penis and termed the **Meatus urinarius.** It is protected by a loose pouch-like skin coming from the floor of the belly termed the **Prepuce** or **Fore-skin,** which consists both externally and internally of skin, the inner side being in many loose folds and thin, but containing many glands which secrete a peculiar blackish-white odorous substance known as **Smegma prepuci.** The thin

skin is reflected from the inside of the prepuce over the free extremity of the penis called the **Glans.** This latter when distended with blood (erected) is large enough to obliterate all the loose folds, and is described as "trumpet-shaped" or resembling the rose of a watering pot, or mushroom shaped. It terminates posteriorly by a constricted part, the cervix, in front of which is the projecting **Corona glandis.** The nerves of the glaos end in peculiar enlargements in the skin, and thus this part becomes the seat of sexual sense of the male. At the centre is a kind of pouch into which the **Urethra** or **Urine canal** runs for some distance before it terminates. There is thus a small tube and a kind of trench around it, and care must be taken that the round end of the catheter passes into the tube and not into the trench. The latter is specially large on each side and generally contains a mass of hard grey waxy material, in some cases so dense as almost to deserve to be called calculus or stone.

To pass the Male catheter, which resembles the gum-elastic catheter for female, but is much longer, being about 4 feet in length, and about the same diameter as that of the female, the horse should be backraked first, and held by the head with near-fore foot raised. The operator standing on the near side places the hand on the animal's loins, and with the left hand passed into the sheath feels for the end of the penis, which he should grasp as firmly as possible and endeavour gradually to "draw." It is often very slippery and some horses do all they can to resist this liberty being taken with them, but a firm pressure at the perinæum may assist the process by inducing slight erection, or firm pressure may be applied at the root of the penis from above downwards to get it, until the desired result is obtained. Standing a stallion in a warm sun or giving him sight of a mare will sometimes assist to cause protrusion of the penis for inspection or for passing the catheter. Also giving the

animal food, will even in the gelding increase the amount of blood in the penis and at the same time detract his notice of our manipulation of the private parts. Some horses especially geldings have extremely small penis. It is not unfrequent to find the sheath very foul especially in horses troublesome to clean, but a good groom should daily cleanse these parts, and the animal thus properly taken care of will not refuse to allow his penis to be drawn.

The penis having been brought out by the left hand is firmly grasped by its neck with the right hand. An assistant standing on the right side of the horse then gently insert the round end of the well greased catheter into the proper orifice, directing the end of the instrument in the left hand, while the right hand gently pushes it up the passage. Some resistence may be experienced at the root of the penis where the urethra curves round the ischial arch and runs forwards under the rectum. The bulb of the catheter will be felt at the perinæum and as soon as it reaches the root of the penis, the **Stillet** should be withdrawn, and the bulb directed by pressure round the arch and so into the bladder, the entry of which will be denoted by flow of urine if any be present. A couple of greased fingers may be inserted into the anus to direct the catheter or to feel the cause of dung resistence which it may experience after crossing the arch. A little firm pressure may be required in using the catheter, but there should never be any jerking action which might injure the mucous membrane of the urethra.

Withdrawal of the instrument must be effected gradually and with care. It is said that sometimes the round end of the catheter becomes fixed in the semen ducts or those of the glands round the urethra near the bladder, but this is certainly not frequent, occasionally a little muscular spasm causes temporary resistence, but by gradual pressure this is soon overcome.

The **Milk-ducts** open on the free extremities of the **Teats** of the udders or mammary glands. These ducts sometimes require to be explored by means of a probe inserted into them, or a fine tube termed **Milk-syphon** which is much less frequently used for the mare than the cow. When the teats will not bear the compression necessary in milking, metal tubes are passed up the orifices and suction effected by means of elastic tubing extending from them, which are termed milkers.

The **Tear-duct** which has its orifice in the nose is sometimes explored by means of a long probe but this cannot be done throughout its whole course on account of the narrowness of the bony passage through which it runs.

The **Lachrymal canals** situated at the inner canthus of the eye may be explored by use of very fine and thin probes. However the tear passages are seldom subject to more than temporary obstruction.

Thus we complete our examination of the orifices of the body, and it will be observed that by careful exploration of them, much more can be ascertained about general state of the body and conditions of particular internal organs, than might at first be expected.

CHAPTER V.

PHYSICAL EXAMINATION OF THE HORSE.

There are certain manipulations of which we can inform ourselves still more than we have already done as to the condition of the body of the animal under examination. These processes consist in the use of one of the organs of sense either with or without the aid of special instruments. They are processes which should be practised carefully and frequently on the healthy animal, before one can be considered competent to attempt them in disease. It is only by familiarity that we can acquire perfect confidence in the use of such processes, and it is only by routine adoption of them that we can obtain the information required in examination of horses.

The principal of these processes are :—

(1). **Auscultation** or listening to interior sounds by placing the ear on the surface of the body.

(2). **Percussion** or appreciation of the sound made when blows are applied to the body surface.

(3). **Mensuration** or determination of changes in bulk and relative or absolute position of organs.

(4). **Palpation** or educated touch for determination of changes in parts by feeling them.

(5). **Pulsometry** or taking the pulse, which is a special application of palpation for determination of the conditions of the circulatory system.

(6). **Thermometry** or determination of the temperature of the body.

Other matters to be attended to are the state of the **Skin** and **Mucous membrane**, and the conditions of the **Excretions** and **Secretions**, and **Wind or Breathing**

power. By resort to all these means it will be seen that practically all the processes and structures of the body as regards their healthiness are tested. They must, therefore, be noted and practised in detail to fit the student or practitioner for the full and complete diagnosis of the disease.

Auscultation is our principal means of examination of the respiratory system, and without it our diagnosis of chest-disorders would be imperfect. It is also very useful in determination of the state of the heart, and has limited applications even in abdominal disorders, thus sometimes the rumbling of the bowels or absence of sound in particular parts of the belly enables us to determine the position of particular viscera. Auscultation is either **Mediate** or **Immediate**, in the former case the ear is supplemented by an instrument termed the **Stethoscope**, of which several kinds are obtainable made of ivory, boxwood and other substances. They are straight and rigid, or flexible and adapted for one or both ears. The **Binaural flexible stethoscope**, is the best for general purposes. **To use the stethoscope** adopt the flat end to the ear with the tube practically continuing the external auditory canal, or fit the end of the tube in the ear, and apply the funnel-shaped end steadily and evenly to the surface of the part to be auscultated. **Immediate auscultation** is the one more generally adopted in veterinary practice, either the ears being applied directly to the skin of the animal, which is the best method, or else a thin cloth such as an ordinary pocket handkerchief being used between the ear and the part, some allowance being instinctively made by the practised observer for such slight friction sounds as will arise from the intervention of the thin medium. Precaution must be taken to ensure safety of the observer from bites and blows by the animal, he must stand in one of the positions pointed out as safe, and should when necessary have a fore-foot raised or otherwise protect himself as

experience suggests. Horses are seldom troublesome when auscultated unless the part be sore or the surface rendered irritable by stimulant applications. Auscultation is rarely made over the nasal chambers and sinuses of the face, constantly down the front of the neck along the course of the wind-pipe (trachea) and on both sides of the chest, occasionally over the belly, and in the mare sometimes against the hind limb at the flank with a view to detect the beatings of the fætal heart.

Each side of the chest is divided into nine regions by imaginary lines running from above to below, or from back of the shoulder to the last rib. The main divisions are the **Superior, Middle** and **Inferior,** each being again subdivided into **Anterior, Middle** and **Posterior.** There are two principal lung sounds detectible in health :—

(1). **Tubal.** (2). **Vesicular.** In disease various sounds may be found and it requires quite a well-trained ear to detect difference in tone, intensity and resonance of these sounds. However it is all a matter of practice to detect and distinguish between them, and of education to determine on what special internal conditions the differences noted depend. Friction sounds, gurgling, cooing, wheezing and other familiar terms are used to express what is heard, and a kind of special phraseology for auscultation has arisen.

Percussion is employed very much like auscultation but its results are generally considered as reliable. It is performed immediately with the ends of the fingers and with the knuckles, or else a small hammer is applied to a kind of shield called **Pleximeter** which is placed on the part. Usually the extended fingers of the left hand are placed firmly on the part and used as a pleximeter.

Immediate percussion can only be applied to firm parts such as the ribs and facial bones. The following

parts are percussed for determination of health and disease :—

(1). Nasal chambers.

(2). Facial sinuses.

(3). The walls of the chest.

(4). The walls of the belly.

Mensuration is often performed roughly with eye or hand. The opposite sides of the body are compared and the normal is contrasted with the condition present. Some implements specially prepared for the purpose are used, such as the measuring standard for height, the spring-tape for measurement of girth and different parts of the limbs, and Smith's spring-measure for the comparison of pasterns and hoofs. Large compasses of wood, metal and other materials are, sometimes, used in ascertaining the exact width of chest, measurement of collar and so on. An ordinary yard measure may prove very useful but the spring tape is more convenient. An attempt has been made to special mensuration in chest disorders, the distances being taken from the shoulder to the last rib on each side, &c. This method has not proved of much practical value. Since St. Bel took carefully the dimensions and measurements of Eclipse, attempts have been made to reduce the study of the proportions of horses to a mathematical problem. There are so many qualities however essential to the make of a good horse, that although some general principles have been arrived at, *e.g.* long fore-arms and thighs are points to secure speed, these are at present extremely elementary and have by no means yet been reduced to a satisfactory system.

Palpation can be easily and conveniently applied to almost every part of the body for determination of pain, unusual resistance or resiliency and unusual shape of organs. To the anatomist it is a most valuable means of

diagnosis, and even by the non-skilled observer it is not to be despised. We have already seen to an extent, how valuable the touch, direct or by means of probes, sounds and other such instruments, is in examination of a horse. The temperature of parts is also observed in palpation. Further instances of the value of palpation, are the detection of abscess by the feeling known as fluctuation, the eliciting of signs of pain by pressure between the ribs in pleurisy, on the belly in cases of peritonitis, over the liver in hepatitis, or by firm pressure on the loins when the kidneys are the seat of disorder.

Pulsometry or taking the pulse is one of the most valuable means of testing health or of judging diseasee The **pulse** is that beating or enlargement alternated with resumption of the original size which arteries undergo when the heart contracts, and forces them to contain more blood by an yielding of their elastic walls. The number of beats of the pulse therefore informs us of the number of times the heart beats in a minute, but more valuable in formation than this, is conveyed by the tone or "feel under the finger", sharpness or the reverse, and regularity or irregularity of the beats. The pulse-wave travels from the larger arteries to the smaller, but there are only certain vessels where "we can take it", for which purpose the artery must be near the surface distinctly detectible and compressible against something and unyielding.

The **Pulse** of the horse may be taken at :

(*a*). The **Submaxillary artery** where it winds round the lower jaw from the jowl, along the front of the thick fleshy mass of the cheek (masseter muscle). This is the most frequent seat at which the pulse is taken, and it is simply a question of convenience whether the right or left artery is felt; perhaps the left artery is the best for right-handed men to get into the practice of feeling, because the skin of the left hand is generally thin and therefore feeling

a little more sharp in the left hand than in the right. The left hand being placed on the animal's nose to prevent him jerking up his head and keeping it steady, the right hand is used for holding the watch in the palm of the hand and the first and second fingers are so placed near their tips that the artery lies lengthwise between them. It runs round the jaw with a vein, a duct from the parotid gland (steno's), and a small branch of a nerve, but it can be readily distinguished by its slipping under the finger and then when grasped firmly and pressed, being felt to pulsate. The number of beats in several successive quarter minutes may be felt. At first in nervous animals it may be a little fast, but if the horse is handled and kept quiet, it will soon settle down to the beat indicating of the animal's state of health. When the horse is quite well, his heart beats **36 to 40** times per minute. The smaller the animal the greater the number of pulse-beats. Constitutional vigour and sanguine temperament somewhat increase the number, and improve much the tone of the pulse. When there is swelling under the jaw as in strangles, we must take the pulse at some other artery.

(*b*). The **Temporal artery** is situated at the supero-posterior part of the cheek outside the joint between the upper and lower jaw, just under the prominence known as the zygoma or temporal arch. The artery runs round the jaw with a vein and branch of nerve, and for about an inch it lies against the tendinous surface of the masseter muscle. It may be felt with ease by the finger pressed against it and is as convenient as the pulse below the jaw.

(*c*). The **Radial artery** is a favourite vessel with some practitioners as an index of the pulse, but not with others as the vessel is not large, and is freely movable and difficult to feel. The hand may be passed round the bend of the elbow and the artery felt for in a space between the two divisions of a muscle known as *pectoralis transversus*.

(*d*). The **Plantar arteries** on either side of each pastern rather backwards, can be readily felt in thin skinned horses and when there is some inflammation in the foot. However when the skin is thick they are not distinct and so are not always convenient for taking the pulse.

(*e*). The large **Metatarsal artery,** contrary to the rule that most large arteries in the limbs lie on the inner side, runs downwards between the outer splint and the large metatarsal bone. It can be felt by resting the fingers on the leg just below the hock on the outer side where it lies in a groove.

(*f*). The **Posterior aorta** may be felt in the rectum, which we have already noticed.

(*g*). By firm pressure along the channel of the neck with the ends of the fingers, the pulsation of the carotids may be felt. The so called **Venous pulse** must not be mistaken for this. It is a regurgitation in regular waves of the blood in the jugular vein, generally indicative of heart disease, but seen also under other circumstances.

(h). The number of beats of the **Heart** can be ascertained by auscultation on the left side behind the point of the elbow. But from this we can give no idea whatever of the tone of the pulse.

The valuable instrument termed **Sphygmograph** which is used for obtaining traces of the frequency, force and character of the pulse-beat, has been used for the horse but not yet generally adopted in consequence of difficulties in its use and the intractibility of patients. A somewhat similar arrangement is used for the heart's beats, and is termed the **Cardiograph.**

Physiologists have recorded measurements of respirations also by means of the **Pneumograph.**

Pulse-charts are useful records of variation in the number of beats for information of the Surgeon, they are

usefully combined with the temperature records. The preparation of these charts is a very simple matter, they save a lot of writing, and much valuable information as to the state of the patient may be gained by a glance at one of them. They need to be prepared with care and made as full as possible. There are various forms of charts in use, the form we find best for veterinary purpose is that shown on the next page.

The beats of the heart can be felt on the left side against the point of the elbow, but sometimes also on the right side, especially when the animal is thin or very poor in condition. Besides the pulse or beating of the heart we have its **Sounds** to guide us. These are examined as to their position, nature and intensity. The **Heart-sounds** are two in number :—First comes a long, dull sound. It is synchronous with the ventricular systole, and is said to be produced at the time of the closure of the auriculo-ventricular valves. It is audible as a sound "**Lubb.**" The second sound which is short and sharp is caused by the sudden closure of the semilunar valves when the ventricular systole ends. It is represented as "**Dup,**" and is followed by a pause.

Heart-disease is rather rare in the horse but not so in the ox. The heart sounds and the results of auscultation need more care in veterinary practice than has hitherto been bestowed on them.

Thermometry is the estimation of the degree of the body heat. In days gone by, this used to be roughly tested by a finger in the mouth, by feeling the surface of the body, or by handling the legs and ears. These methods of practical value are by no means to be despised, but now we have more exact methods of investigation and record. They can be practised when no **Thermometer** is at hand, as they show the distribution of the body temperature. Thus in old works on veterinary surgery, we find stress

"RECORDS OF TEMPERATURE, PULSE AND RESPIRATION."

Disease _____ Age _____ Sex _____ Colour _____

Date of Attack _____ Result _____ Date of Result _____

Dates of Observation. / Days of Disease.			Time, a.m.	Time, p.m.	Time, a.m.	Time, p.m.	Time, a.m.	Time, p.m.	Time, a.m.	Time, p.m.	Time, a.m.	Time, p.m.	Time, a.m.	Time, p.m.
Respiration per minute.	Pulse per minute.	Temperature.												
			8											
			6											
50	110	106°	4											
			2											
			8											
			6											
45	100	105°	4											
			2											
			8											
			6											
40	90	104°	4											
			2											
			8											
			6											
35	80	103°	4											
			2											
			8											
			6											
30	70	102°	4											
			2											
			8											
			6											
25	60	101°	4											
			2											
			8											
			6											
20	50	100°	4											
			2											
			8											
			6											
15	40	99°	4											
			2											
			8											
			6											
10	30	98°	2											
			8											
			6											
5	20	97°	4											
			2											
			8											
			6											
		96°	4											
			2											

Veterinary Surgeon.

laid on "extremities warm," "ears and legs deadly cold," or excessive heat of the body surface, &c. A small instrument has recently been introduced for determination of the heat of the surface of the body. It is known as the **Surface thermometer,** and will doubtless hereafter prove of great value when applied in veterinary surgery. The Thermometer of most general value is the **Self-registering clinical thermometer,** the special points of which as compared with the ordinary clinical thermometer are :—

(1) Its mercury "bulb" is a long narrow tube capable of readily being influenced by the temperature of the surroundings.

(2) The graduated scale is marked nearly from 80° to 120° F.

(3) There is a small loose piece of mercury in the tube separated under all circumstances by a slight bubble of air from the main column. When the latter goes down it leaves this index in position, the graduation being so arranged that the top of the index gives the "**Reading**". This ingenious arrangement is of great value to the clinical observer, especially as enabling him to read the result long after the temperature has been taken by an assistant.

To set the thermometer *i.e.* to reduce the index below the scale, the tube is taken between the second finger and thumb with the bulb downwards, and the tip of the fore-finger resting on the upper end of the instrument, then by the jerks of the wrist on the bent knee; or by means of long sweeps of the arm ending abruptly, with the fore-finger resting below the bulb. Thus the index is gradually caused to pass down below the scale, but not below the narrow part of the tube called the neck of the instrument, otherwise it will mix with the general mass of mercury and the instrument be no longer self-registering. Sometimes, especially in hot climate, we find that the index becomes divided into two or more parts which

lessens the accuracy of its results. The thermometers are delicate instruments, to be used carefully especially as they are also expensive. The best are accompanied by a certificate of verification for which a small extra charge is made. To the best instruments the scale is given both in Centigrade and Farenheit degrees, the former is used on the continent of Europe, and the latter in English-speaking countries. This difference is to be regretted as giving rise to the necessity for frequent calculation in translating continental records into English. Some instruments are self-magnifying, *i.e.*, have the glass of the tube so arranged as to be enlarged and easy to read, which is a useful but unessential refinement. In the horse the thermometer is used in the rectum, and in the mare it may also be used in the vagina, which gives somewhat lower readings.

To use the thermometer, we have the horse's head and near fore foot held up, the tail being drawn to the off quarter by an assistant. The operator rests his left hand on the left quarter, dips the bulb-end of the instrument in oil, which may be slightly moved if the weather is cold, in order to prevent spasmodic contraction of the anus when it is inserted. The tube is then taken like an ordinary writing pen and its bulb-end inserted through the orifice gently so as not to excite resistance, and gradually in order that it may become warm by the parts against which it lies before taking up its final position, which should be against the wall of the bowel about 3 or 4 inches. The slightest irritation may lead to expulsion of dung, if so, the instrument should be removed while the "dropping" is going on; care should be taken that the bulb does not become embedded in a mass of dung, which it is thought, renders the reading a little too low. A period of three minutes' retention in the rectum suffices for ordinary purposes, but this is nearly a degree under the reading which may be obtained by keeping it in position **Four minutes**, after which but little if any rise will

take place. In important cases therefore we should keep the thermometer in for four minutes; in ordinary cases for three minutes; and when a number of animals has to be examined at least for two clear minutes in each case. Shorter readings than this give faulty results. By pressure of the ends of the fingers around the anus we should ensure the non-admission of air from outside through the relaxed orifice which is a source of error in some cases. Sometimes the oil or water into which the thermometer is dipped is too hot, so on insertion the index should be at about 95° F. If the thermometer is not self-registering, the reading should be taken while it is in the rectum. If the horse is very troublesome, the instrument should be withdrawn, because it is better to lose the reading than the instrument. With care and patience we can complete our observation satisfactorily in most cases, but if not, we must fall back on the old plan of detecting the heat of mouth by means of the finger. The reading should at once be recorded preferably on the chart, and its bearings on previous readings ascertained. A good plan is to have a loop of coloured string on the thermometer in order that it may be withdrawn and not dropped when the hand is sharply removed from the anus, the loop being passed over the hand on to the wrist. The colour of the string will enable it to be seen readily if it falls on the straw-bedding. On completion of the three minutes' insertion, the thermometer must be slowly withdrawn, cleaned over the scale by a sweep of the fingers and the reading taken. It should not be dipped in hot water to clean it before reading, as we have known it to be done, and as a result remarkably high readings recorded. The **Normal temperature** of the horse in the rectum ranges from **99. 4° F. to 100. 4° F.**, but the average is **100° F.**

The following circumstances affect it in health:—

(1). Time of day.

(2). Climate.

(3). Food and drink.

(4). Exercise.

(5). Sex.

(6). Age.

(7). Other influences.

The various organs of the body differ in temparature, they also vary according to their physiological activity *i.e.*, the amount of blood circulating through them. The acts of breathing in health are considered to be to the pulse beats about as 1 : 4, but the respirations increase much with rise in atmospheric temperature, especially at mid-day in the tropics.

The "**Wind**" or **breathing powers** are tested in various ways. The best and most thorough way is a good gallop in the case of a light-bred or heavy draught horse, and up hill for a cart horse. No doubt the best method is for the examiner himself to ride the horse and place the head at different degrees of elevation and depression, and to twist it from side to side. This may be done with very valuable animals or in doubtful cases, but as a rule a trustworthy rider should be "put up" and instructed to gallop the animal past to and from the examiner as often as required, ending up by stopping as abruptly as possible opposite the examiner, so that the ear may be at once put against the nostrils, along the trachea, and on either side to the various parts of the chest. The latter process is not generally adopted but is specially to be recommended because we auscultate thus under very favourable circumstances, and in this way we may, to an extent compensate for the fact that we cannot, in examining the chests of our patients, regulate the amount of air in the lungs, and call for a cough or otherwise alter conditions as the human surgeon can. The best place for galloping the horse is soft ground on which the foot-fall makes but little sound. The healthy sound audible when the horse is being galloped

is of a rushing of air into and out of the nostrils, which are fixed at their utmost distension. When they are not fixed but flap or vibrate, the loud sound known as **High-blowing** is produced. It is heard in horses out of condition and also in animals very **Fresh** *i.e.* in want of exercise and in high constitutional vigour, but it is not a disease. Occasionally pads are fixed in the false nostrils to prevent this, but conditioning and regular work are the best means of getting rid of it, and a horse at full speed has something else to do than flap his nostrils about, and it is the familiar sound called **Snorting,** which is a means of freeing the nostrils from any impediment. **Roaring** and **Whistling** are abnormal sounds in consequence of narrowing of the air passages or irregularity in their shape. Occasionally they depend on obstruction or deformity of the nasal passages.

When for any reason it is not practicable or advisable to gallop the horse, auscultation will generally afford as satisfactory information as to his lungs and wind-pipe, but we require to adopt other means to test the larynx, and these are:—**Coughing** and **Putting him against a wall.** The latter method is accomplished by the examiner taking the reins in the left hand and a whip in the right. He quietly walks the animal until his right side rests against a wall, then suddenly and unexpectedly threatens the horse with the whip not striking him, and thus causing him to throw up the head and again take a deep inspiration (**Ribbing**). If he be a **Roarer** or **Whistler,** a peculiar **Grunt** will thus be elicited and indicate the need for galloping him as a further test, but fat and heavy horses sometimes grunt without having any laryngeal disease. It must be clearly understood that a **Grunt** is not always a **Roar,** nor a roar, a grunt. But the grunt is always most suspicious.

Coughing a horse by artificial means is done by inducing that act of a reflex nature, which nature resorts to for removal of any irritating substance from the larynx, trachea or lungs. The irritation is produced by pinching

the first ring of the wind-pipe or the lower part of the larynx between the fingers and thumb. Some horses, especially roarers, are very difficult to cough, others especially in cold and other throat irritations, cough painfully on the slightest pressure. It is a common idea among horsemen, with probably some truth in it, that disease changes may be induced in the throat by too frequently coughing the animal, as in fairs, &c. If after coughing the animal, he as it were clears his throat by violent expiratory efforts, the cough is said to be a normal one ; but if he continues to cough after the irritation, we must look upon the animal with suspicion, and try to trace the cause of it from the nature of the abnormal cough.

While the thermometer is in the rectum, the **Respiratory acts** can be easily seen at the flank, and their nature and frequency noted. The two breathing acts are **Inspiration** and **Expiration.** In the former the ribs are drawn outwards and thus causes a bulging of the belly. In the latter there is a fall of the ribs as a result of elastic recoil of the walls of the chest. The **Number of respirations** in a horse per minute is **10 to 15.** Frequent, imperfect and short-breathing is found in horses out of condition as well as in those with their lungs in a chronic diseased state, and it is known as **Short-windedness** or **Huskiness** ; it is also common in animals which are too fat. A state of laboured expiration in which there is a break in breathing, is common in some parts of India such as Bombay (especially at certain seasons of the year) as a symptom of **Asthma** or **Broken wind.**

Examination of the state of skin and mucous membrane is also resorted to in determination of health and disease. The skin of the horse being covered with hairs, prevents the use of plasters in surgery to a great extent, and necessitates shaving or clipping the hairs before blistering and firing. The hair varies in development in different parts of body, as a rule they are coarse

where the skin is thick and *vice versa*. In certain parts which we have already indicated, it grows very long as **Feelers, Eye-lashes, Mane, Tail** and **Fetlocks**. On the inner side of the limbs, about the muzzle, and near the orifices as a rule, the skin is thin, soft, tightly attached to the parts underneath it, and scantily furnished with hair. In other situations, such as jowl, breast and flank, the skin is loose, and these are the parts most liable to swell in dropsy, and are most suited for **Subcutaneous** or **Hypodermic injection** of medicines. The condition of the subcutaneous areolar or connective tissue is to an extent indicated by the looseness of the skin. Non-thrifty animals have the skin dry and apparently firmly bound down to the parts beneath, the condition being known as **Hide-bound**. The state of the coat known as **Staring**, is an erect and rigid condition of the hairs, the result of involuntary contraction of their erector muscular fibres. Technically it is called **Cutis annserina** or **Goose skin**, and is seen in the shivering stage of fever, and also when the animal is suddenly exposed to cold. In the warm stage of fever the skin becomes dry but glossy. In severe pain there are often **Warm-sweats**, which may be limited to the part of the skin opposite the organs principally diseased. **Cold sweats** are a very bad sign as indicating decline of vital power and approaching death. Such parts of the skin as are the seat of specially developed glands *e.g.* the heels, cleft of the frog and margin of the eye-lids may be the seat of excessive secretion from inflammation or congestion of these glands. The Phenomenon of **Shedding** or "**Changing the coat**" also termed **Moulting** is one which occurs periodically with the change of seasons, the summer coat is light, and thin; the winter one being long and warm. The period of change is to an extent one of delicate health in some horses more than others, especially when the process has been interfered with by removal of the animal to a climate other than its native one. **Clipping** and **Singeing** are two processes connected with the

hygiene of the skin, which necessitate great care and attention to the health of the horse, since they place the animal on the verge of disease, being unnatural interferences with normal arrangements. **Trimimg the heels** renders them more liable to "**Crack**" than if the long hairs had been left on them. **Banging** or cutting the hairs of the tail short, lessens the use of this organ as a fly flapper, although it renders the horse look "Smarter". The long mane and tail of the Stallion certainly render him more handsome than he would be without these sexual marks, and good judges of cart-horses like to see the legs of these huge animals well "**Feathered**" from the fetlock even upto the bend of the knee.

The various **Mucous Membranes**, *viz.* **Buccal** (mouth), **Schneiderian** (nostrils), **Conjunctival** (eyes), **Vulval** (vulva), and others have been already described. Their colour varies considerably in accordance with health and temperament. In the robust and sanguine animal they are of a bright pink, differing somewhat in different membranes, the appearance of each of which must become familiar by practice in looking at them. A "**Heightened**" colour by which must be understood increased redness, denotes fever or local inflammation or merely temporary increase in the circulatory activity generally or locally.

Yellowness denotes liver derangement, and purple colour may depend on defective breathing. Thus in many ways we may learn much from the colour of these membranes. Dryness or excessive moisture (with the nature of the discharge), also the presence of spots, eruptions, ulcers, or such other matters must be carefully looked for as indications of disease. Pale membranes indicate anæmia or bloodlessness. The exact measure of this is determined by the instrument termed the **Hæmato-cytometer.** Many appearances, which to the unexperienced seem very slight, are, to the physician most valuable guides in diagnoses, prognosis and treatment.

The principal excreta or materials thrown off from the body are the **Fæces** (dung) and **Urine**; but the expired air, sweat, and such temporary evacuations as discharges from the different parts of the body, **Milk, Tears,** and so on, sometimes give valuable results on examination.

The **Fæces** are the undigested or indigestible remnant of food, with which is combined material excreted from the wall of the food canal, and especially from the liver. The dung should be examined as to its odour, composition and colour. A very foul odour of the dung indicates indigestion or **Foulness** from over-feeding. The odour of the dung of the horse is normally not unpleasant. The presence of oats or other food substances undigested must be taken as an indication either of improper preparation, defective mastication, or imperfect digestive processses. **Worms** in the dung may to an extent account for abnormalities. Normally the fæces is expelled in well-formed pellets termed "**Dung-balls,**" but when it is expelled in a soft pultaceous mass like a sausage it indicates over-feeding, and that the animal is verging on liver or other disease. A moist or watery state of the evacuations, "**Looseness,**" also is objectionable to the horsemen. Excitable animals generally of bad constitution with flat sides, narrow chest and pot-belly, are specially liable to looseness and are known as "**Washy-horses**". Very dark dung indicates vigorous action of the liver, clay colour shows torpid liver, except when due to colouring matter of the food.

The **Urine** is one of the most important excretions on account of its bulk and of the substances of which it is composed. In this secretion the greater part of the surplus water and the refuse nitrogenous materials are removed from the blood, and by a special mechanism expelled from the body. Its secretion is constantly going on, but its expulsion is periodical. For determination of its character, either some may be collected in a clean

vessel and examined at once before it undergoes decomposition, or some may be drawn off by use of a clean cathetar. The matter to be noted as regards the urine may be thus classified :—

(1) **Quantity**, either total amount passed daily *i.e.* in **24** hours, or amount passed at one act of expulsion called **Urination, Micturition, Staling** or "**Making water**". The total daily amount of urine is about **8½ Pints**, but it varies to an extraordinary degree with the amount of water taken, the activity of the skin and other excretory organs and the process of nutrition. Sometimes the amount is considerable as in **Diuresis** or **Diabetes**, and in other cases as in fever the urine is scanty (anuria). In the act of expulsion the animal fixes himself in the well-known position called "**Lamping**", which is favourable to pressure of the abdominal walls on the urinary bladder. A well-bred horse, especially an Arab, does neither urinate nor defecate when the rider is on his back, but hunters and other hacks are trained to pass urine when a peculiar whistling sound is made in the hunting field. The rider instinctively stands up and leans forward to remove pressure from his horse's loins, when the animal postures himself for staling. Mares suffering from sexual excitement are a nuisance in this respect, squealing and squirting out small quantities of urine and lashing out with their hind legs when any other animal comes near. The urine in the mare passes in torrent and finally in showers.

(2). **Mode of expulsion.** That of the male should pass in full stream and straight until towards the end of the act of staling, when the residue is passed in jets. Any alteration in shape or direction of the stream, apparent difficulty in the act or other deviation from healthy expulsion, should at once lead to examination of the urinary passages with or without the catheter.

(3). **Quality of urine,** physical, chemical or microscopical. As regards physical character we note :—

(*a*). **Density,** ranging from the syrupy condition to the watery condition. Urine for examination should be collected either some hours after ingestion of food or water (urina sauprinis); shortly after feeding (urina cibi) ; or after drink(urina potus). The former is the best for testing to determine the state of health. The average **Specific gravity** of the urine of the horse is **1,036.** The highest registered is **1,050** and the lowest **1,014.** It is tested by means of a special instrument, a form of hydrometer termed the **Urinometer.** No veterinary establishment is complete without this useful instrument required for constant use.

(*b*). **Re-action,** as tested by red and blue litmus papers. The urine of herbivora is normally **Alkaline,** in wasting diseases it may be found acid, occasionally it is neutral. For correct estimation of re-action the fluid should be tested directly it is passed, because changes of a fermentative nature set in very soon, which render it alkaline.

(*c*). **Colour** of urine in health is a light yellow or amber, but in disease it ranges upto the intense yellow or orange, approaching red.

(*d*). **Turbidity** is naturally more considerable in herbivora than in man and carnivora, and may from extensive admixture of mucus, amount to considerable cloudiness settling down, when the specimen is left quiet for a short time. Sometimes gravel or crystals cause much turbidity.

Spectroscopic, microscopic and chemical characters of urine will be found in works on veterinary Physiology.

The **Expired air** is less convenient for examination than other excreta. As compared with the inspired air it is warm, contains more carbonic acid gas and less oxygen. Offensive breath is found in tooth disease, indigestion, blood disorders, severe lung derangements and other cases.

The **Sweat, Perspiration** or **Cutaneous secretion** is generally insensible *i.e.* not perceptible to our senses, but it is considerable and physiologically so important, that extensive disease of the skin or body surface with an impervious coat of varnish causes death of the animal. Violent exercise, pain, galloping in clothing, excessive clothing, and a few drugs called diaphoretics induce sweating in the horse, a process much resorted to in training, for which Turkish Baths more or less perfect have been got up in some establishments. Offensive sweat is an illustration of change this excretion may undergo in disease.

The **Tears** normally pellucid, sometimes become mixed with mucus and so acrid that they excoriate the skin of the eye-lids and nostril over which they flow. They may become cloudy by admixture of blood, mucus or pus. A dry abnormally transparent or bright eye is seen in the early stages of fever.

The **Milk** is the secretion found in mares, but seldom requiring examination, and for details special works must be referred. Its average chemical composition is :—Water 92·5, Casein 1·3, Albumin ·3, Fat ·6, Lactose 4·7, and salts ·3. Milk may be examined by artificial processes which have attained much elaboration of detail. The **Lactometer**, and **Lactoscope** are especially useful instruments, but seldom resorted to in examination of mare's milk. Only in the case of brood mares the milk needs special attention as to its quantity, quality and supply.

CHAPTER VI.

ACTION.

We have hitherto examined the horse at rest, next we proceed to see him in movements. The animal is brought out of the stable with a simple snaffle bridle and before being handled, he may be trotted quietly up and down once or twice. The **Trot** is the true pace for testing a horse's action, and it is occasionally the case that a horse running immediately after coming out of the stable, will trot more quietly and show his action more truly than if standing out for some time. Again in doubtful cases it is better to see the horse run up and down once or twice before handling, and once or twice after, than frequently at one time, which may give the impression of slowness of judgment. Another object is to avoid prejudice in the mind of the examiner, conscious or unconscious such as might be excited by the detection in handling of some defect which in our judgment ought to lame the animal. The second run later on, gives the opportunity of judging the action when aware of what defects in structure are present, and what defects in action may be anticipated.

Action means movement of the feet during progression. When speaking of the fore-legs it is said "**Action in front,**" and when alluding to those of the hind limbs, it is said "**Action behind.**". Action may be **Good, Bad, Peculiar,** and **Defective.** The term "**Good action**" is specially applied to high action in trotting horses, but it differs according to the pace and the use to which the animal is to be put. Thus for a trotting horse, the throwing out of the limbs absolutely essential for speed, is very different from **High** or **Showy action. Bad action,** is that which is imperfectly suited for the purposes for which the horse is kept, or risky to the animal. The low tripping and uneven walk of the Arab is bad as unfitting him to

an extent for hack work; the rolling gallop of the heavy broad chested cart-horse is bad as unfitting him for speed; the peculiar trot known as **Daisy cutting** or **Daisy Clipping**, where the feet are scarcely lifted from the ground is bad as rendering the animal liable to **Stumble**. Peculiarities of action are best seen at the walk; the animal should be given his head and led with as loose rein as he will allow to and from the examiner. If he is inclined to kick about and "make a fool of himself," he should be steadily and firmly walked about until he settles down. A great deal of tact and skill in managing horses is required of the groom who has to run often a number of strange horses. It is better to have a man who has no special interest in the sale of the horse to do this, and to get grooms about a veterinary establishment used to the duty, in order that a strange man need not be required, because there are numerous little "dodges" which an experienced man may be up to, especially if he has been some time in a dealer's yard. As the horse walks from you, watch his hind limbs, observe if there is any special catching up of either one or both feet; how the hock is flexed, and whether the hind legs cross each other or go too wide. As the horse comes towards you, watch his fore feet and chest, and observe whether the feet are thrown in or out. Animals which "**Turn their toes in**" are liable to cross their legs and throw themselves down or to "**Brush**" or "**Hit**" *i.e.* hit the posterior part of the inner side of the fetlock. Those which "**Turn their toes out**" are tied in at the elbows *i.e.* have the points of the elbows turned in and liable to brush against the side which limits the range of action. Observe both fore and hind feet, whether the normal method of putting the foot down is preserved, the fore feet should be as nearly as possible level, the hind feet meet the ground with the toe first, the heels are then brought down and lifted with an outward movement, and the toe is the last part to leave the ground. All our notions

as to the exact phases of different actions are in a state of change, in consequence of the results obtained by instantaneous photography, the results of which show that painters represent on their canvas what impression is conveyed to the eyes as to positions of horses in movement, not any one phase of such movements which would seem ungraceful and strange in the extreme.

In order to judge action, we distinguish whether a horse moves "well" *i.e.* with harmony of motion of the several parts and the proper action of each; or moves badly" *i.e.* with want of harmony or thorough motion of any part. Thus when the fore and hind limbs do not move harmoneously, the hind is apt to hit the fore and produce **Overreach** or **Clinking**; when two fore or two hind do not move harmoneously, **Cutting** results, or striking the inner and upper part of the knee in the fore-limb called **Speedy cutting.** Uneven tread is a very frequent result of disease, thus *e.g.* an animal "**Going on the toes**" with "**Stilty action**" and wearing out the toes of the shoes is to be looked at, specially for navicular disease in the fore-limb, and spavin in the hind. A horse which goes on his heels with the fore feet should be specially looked at for ring-bone or laminitis. Again special wear of the inner or outer side of the shoe may be due to splint or other defect of one side of the limb. It must, however, be remembered that individual horses like individual men have their peculiarities in gait, and the experienced eye and ear, together with matured judgment enable us to distinguish these peculiarities from actual lameness. It is on such cases that one gets differences of professional opinion, which is not to be wondered at, considering that the experience of all men is different and their judgments are liable to vary, therefore the purchaser must rely much on the confidence of his professional adviser's opinion. **Bridle lameness** is a term applied to apparent lameness due to an animal being improperly led, or having a sore

mouth or bit hurting his mouth on one side so as to cause him trot uneven, it is also seen where a harness horse has always been accustomed to be driven on one side in a pair. A **Blind horse** and a **Stargazer** are liable to show extremely high action. "**Beaning**" is an ingenious device for making a horse lame of one foot, equally lame as the other and so make him "go even." A clever groom may so lead a horse as to prevent him dropping his head on the sound foot although lame in one fore-limb. Such are some of the many difficulties one has to contend against in judging action for detection of lameness, even without rascalities and peculiarities to cause complications, diagnosis of lameness is complex enough. It is said that the celebrated veterinarian Professor Dick could diagnise lameness by simply hearing the sound of a horse's action. But action requires as much if not more care in examination, as the structure of a part, and to exercise any carelessness and neglect of all available means of testing it, is culpable.

To test an animal for lameness a level run of not too smooth ground and with a gentle inclination up and down is best, an ordinary good road answers best.

Lameness "before" or in front, is shown best in going down hill, lameness behind in going up hill, but the actual action whether good or bad can best be observed on the level. The slowest possible trot is the best pace, but at times as we get more skilled in detecting lameness, a faster trot may be found better. The rapidity of the pace should be varied according to the action of the horse, and the groom leading him should be promptly obedient to orders. In some forms of lameness such as ring-bone and laminitis, the farther a horse goes, the more lame he becomes, in others as spavin and navicular disease, the lameness "wears off" as the animal "warms" to his work, but is very acute when he first comes out of the stable having been allowed to cool after a journey. These are points to be carefully remembered in testing doubtful cases, and judgment should

never be arrived at too hastily before the animal has been thoroughly tested. Slowness is better than erroneous judgment. It is best to have the animal led, but some horses will not allow it and so have to be ridden, in such cases the rider must not drag at the reins but "give the horse his head" as much as possible and get him into an even square trot. Well-bred horses show lameness less when mounted as a rule, because it causes them to show their pluck, but most horses have lameness, especially of the fore-limbs most conspicuous when weight is on their back. A horse trotting up and down should be made to run to and past from the examiner who should stand in different positions as most convenient for judgment, but keeping as much as possible on the left side of the horse. At first it is well to stand some six to ten paces away from the animal and see him trot past, thus the whole figure of the horse is in the eye at one time, and his action as a whole is seen and any unevenness or irregularity detected. Next we should come nearer and as the horse trots away, look at his hind limbs, and as he comes towards us look at the fore. The first point to be remembered is to look at the head for lameness in front, and at the quarter for lameness behind. Secondly, that these parts drop on the sounder of the two limbs. These two points having become thoroughly familiar, the student may proceed to notice some of the complications in diagnosis of defect of action. In some cases, especially splint, although the dropping is actually on the sounder limb, there seems to be a throwing up of the head rather than a dropping. Some lamenesses are very striking to the experienced eye, but obscure to the beginner on account of their severity. Thus in dislocation of the patella, the affected hind limb is obstinately drawn back with toe on the ground, and cannot be brought forward without reduction of the dislocation. Again in laminitis the animal stands "all of a heap" but his position varies according to the feet affected. If both fore-feet are affected, they are stretched forward so as to throw weight on the heels, and the hind-feet are

brought as much as possible, under the centre of gravity of the body. But if the disease be only in the hind-feet, the animal will draw back his fore-feet under the body, and will advance the hind ones, so as to relieve the toes of the latter from pressure. The term "**Pointing**" is applied to the projection of a foot so as to bear but little weight on it, and to bear that absolutely necessary amount of weight in the least painful manner, and that calculated to cause least pain. In different lamenesses the position in which the limb is kept varies, thus there are two kinds of foot—pointing, *viz.* that most frequent in navicular disease where the lame foot is in front of the other with the toe resting on the ground and heel raised in a conspicuous manner. The second form is where the toe rests on the ground, but on a level with the other fore-foot. Another point which is not uncommon is where the foot is extended and the heels rested on the ground. In diseases of elbow or stifle joint, the limb seems to be allowed to hang loosely from the affected parts, the front of the hoof resting on the ground. In "**Break down**" the limb may be kept flexed, or in very severe cases there will be a dropping of the fetlock and excessive obliquity of the pastern. Naturally **Bent knees**, either the result of excessive work or of natural conformation, must not be mistaken for disease. In buying a horse with bent fore-legs we are generally told "he was foaled so," a statement to be received with suspicion; we must, however, remember that there is a strong opinion of practical men in favour of horses with naturally bent fore-legs as little liable to sprained tendons. This peculiarity of conformation is vulgarly described as "going to say his prayers," and differs markedly from what is known as "standing over on the fore-legs." *i.e.* a large prominent breast and fore-legs standing backwards from the bend of elbow to fetlock joint. It is a rule among horsemen that in the fore-limb the **Foot** is the most frequent seat of disease, and in the hind-limb the **Hock**. In disease of the hind-limb either

the limb is carried outwards in a peculiar and conspicuous manner, the quarter being rigid and dropped very much. In acute joint-disease of the hind-limb we sometimes see the foot raised and the limb kept flexed for some time as though this position gave relief. Sometimes the defect may be indicated merely by an occasional spasmodic jerking up of the hind-limb, especially when he "stands over" or first comes out of the stable. When, but one limb is the seat of lameness, detection is simple as compared with defect of one or more limbs. Lameness of both fore when equal in degree causes the animal to go "like a cat on hot bricks," with a peculiar shuffling action, straightness of the fore-limbs and rolling of the chest. It is rare to find double lameness completely, there is even a slight dropping on the sounder foot. Lameness of both hind causes a similar rocking of the quarter, and peculiar roughness of the trot, it is generally due to double bone spavin when a peculiar vibration of the point of the hock will be noticed due to concussion, for the small joints of the hock are lost, and cannot any longer perform their buffer-like duty of lessening concussion. When two limbs of the same side are affected, there is dropping of both head and croup, and when a near limb is affected at the same time as an off one, the same thing is noticed, but a difficulty is experienced in that there is seen sometimes an apparently similar state in which a horse lame of one foot in front, seems lame of the opposite foot behind. This is termed "**Cross Lameness**", and is really only the bringing forward of a sound hind-limb farther than usual to take the weight quickly off the lame limb. Lameness of three or four limbs is almost too complicated for description, and is rarely seen in practice, giving rise to perverted action, more or less extraordinary or conspicuous as going "like a crab", "with three-cornered action", "broad side on", like a "broom-stick" or "all of a piece". All these expressions one sometimes hears in the stable and other places where horsemen and "knowing

ones" mostly congregate. In having a horse run up, he should, if lame, be made to turn from the lame leg, if not lame or doubtful, he may be first turned to the right about and then to the left about. It will be observed that a horse lame behind is very liable to break into a canter and will jerk his hind-legs irregularly or entangle them in turning or use them unevenly, perhaps the irregularity will be more conspicuous a few steps after the turn.

No examination is complete without the horse being tested as to his power of **Backing** freely, and **Turning round.** The groom should hold the reins up and seize both sides of the bit and make the animal move backwards, which he should be able to do straight and without difficulty. Some horses with diseased loins cannot back, and others suffering from the peculiar convulsive disease called **Shivering**, show spasms of the muscles of the hind-limb and tail under this test, though responding to others without apparent difficulty. Next the groom should hold both reins in one hand tightening the near, and raising the right hand, should make the horse pivot round to the right and then to the left. This is the best test for defects of hocks and loins. It is common to find horses "**Gone in the loins,**" especially stallions from excessive covering of mares or from masturbation and sprain of the psoæ muscles. It may be so severe, that the horse when turned suddenly, falls to the ground, or it may simply cause a rolling gait, there may be flinching on pressure of the loins or a cringing almost to the ground when the rider bears his weight in the saddle. **Stringhalt** or excessive jerking flexion of the hind-limbs is rendered conspicuos when the animal has to turn suddenly. Detection of lameness is one of the instincts, for which some people have a natural gift, and others are able to attain a certain degree of proficiency by practice, to be able to analyse action, to note the mode of working of each part of a limb, and see where defect lies. Such conspicuous

matters as defective flexure of hock or knee are plain enough, but there are many imperfections of shoulder, hip, elbow and other parts' action, which cannot be described with benefit to a reader, and are seldom described even by those, who detect them readily. The horseman's hereditary instinct, seldom thoroughly acquired, is seen in this as in recognition of individual horses, and "having an eye for a good horse" *i. e.* being able to pick one suited to special requirements without knowing the why or wherefore. The term, vices of action, is applied to certain defects not amounting to unsoundness, which are liable to endanger the rider, and lessen the value of the animal. As regards them the phrase "Caveat emptor" *i.e.* "let the buyer beware" applies, and the veterinary examiner is not justified in drawing the would-be purchaser's attention to them at the expense of the seller. Soundness is the matter on which a Veterinary Surgeon is consulted; suitability for special work and the advisability of the purchase are quite other matters and must be considered separately. A horseman must judge of form, action and vices, and a veterinarian of soundness. A Veterinary Surgeon who is also an experienced horseman may, therefore, be considered the best judge of horse-flesh, and is generally recognised as such. Yet it must not be inferred that the best Veterinary Surgeon is the best judge of horses or *vice versa*. Of vices of action, the most important are **Tripping** *i.e.*, a catching of the fore feet in such a way as to give a feeling of insecurity. An exaggeration of this, is **Stumbling**, where there is such disturbance of the balance of the body as to constantly induce liability to fall forwards. These vices may be due to many causes, such as (1) defects of conformation, a heavy fore-hand for example. (2) disease of fore-feet or other parts of the limbs. (3) effects of disease, such as the result from repeated bruises of the knees. (4) habit, such as the stumbling seen in Arab horses at the walk or trot. In every case the

cause must be looked for and if possible, removed. Defects in shoeing, overgrown feet, disease of the extensor tendons and front of the limb are the most common causes. The habit of **Crossing the fore-legs** is very liable to bring a horse down, and the defect may be with the rider, for some people have such bad hands that the most sure-footed horse will be thrown down especially at cross-counter work. A mark on the knee, or the sign of a horse, having "been down", deteriorates the value of some kinds of horses very much, but it is not thought much in an ordinary hunter, unless due to obvious defect, and it does not influence the value of an Arab, because of the large number of best and most sure-footed Arab horses is thrown down when young, and galloped over rocky country in Arabia. **Stilty action** is that seen in old animals, where the joints have become somewhat stiff, and neither bend readily nor thoroughly. **Groggy action** is the peculiar stiltiness, seen in navicular disease. A horse is said to be **Foundered**, when he suffers from laminitis, and shows it in his action by going on the heels of the fore feet. **Stale action** is that general defect in movement, not actually amounting to lameness which results from overwork, either depending upon the animal being "worn out" or "used up", or else due to overwork of a temporary nature as in cases of overtraining. A horse is sometimes said to go "**Stiff**" in his action but not really lame, when the inability depends on temporary deposition around or in the muscles of liquid or solid material, and is seen when a horse's legs have filled from standing too long in the stable, or on the day following performance of an unusual amount of work. It is sometimes merely a symptom of lassitude as seen in some diseases such as influenza. **Spasms** are involuntary forced action of muscles, and they may be tonic *i.e.* continuous, and chronic, or intermittent. Thus tonic spasm is seen in lock-jaw, and chronic spasm in stringhalt. The latter

may be also regular or intermittent. Chorea is an example of the former, and stringhalt of the latter. **Percival** defines "**Lameness**" to be a manifestation in the act of progression of pain, inability, weakness or impediment; and the definition is worth remembering, although we can no more by definition distinguish between lameness and absence of lameness than we can between life and death, soundness and unsoundness, health and disease, darkness and light or other opposites. There are conditions where doubt must arise, and which are liable to be viewed differently by different observers, and on which *bona fide* opinions on oath may be given by experienced practitioners. The terms "true action" and "condition" vary in their exact significance according to the ideas of the man who uses them, or the kind of horse he has at the time in his eyes. The **Hunter** must have true action at all paces and be fit to follow the hounds in "wind and limb." The **Racer** must have his muscles of locomotion and respiration at the highest possible pitch or pace, his action must be sweeping and low, and he must be able to "make good time," and on the day of trial must be able to do his utmost, and it is not rare to see the mark a little overshot, when the horse runs straight from overtraining. The carter and farmer, from experience like to see their horses with a little fat to add to the weight, which they can throw into the collar. The **Cart-Horse**, to have true paces must be good and sure at the trot and walk. **Sure-footedness** is a quality for which mules, asses and arab horses are proverbial, it is one of the essentials of true action at all paces and for all uses.

CHAPTER VII.

DESCRIPTION OF HORSES.

The horseman and veterinary practitioner are constantly called upon to describe horses for racing, sale, purchase, registration and so on, and a certain system with a language of its own has arisen, with which every one having to do with horses should be acquainted. Description comprises a short, clear and complete enumeration of the external characteristics which enable one to distinguish a certain horse from all others. A veterinary student will find it most convenient to work into a system in this matter, by remembering the ordinary wording of a certificate of soundness. This comprises a statement of the circumstances of the examination, and of its result. Professionally the veterinary practitioner is responsible for the latter part, but any error in the descriptive portion vitiates and nullifies the document. An example of a very common form of **Certificate** is:—

"*Certified that I have this 4th day of May* **1894**, *examined for Mr. F. Scott of Bombay, a Bay Arab entire horse,* **14·2**, *5 years, with a star, reach, snip into near nostril, and off hind hoof white; I find the said horse has spavin of the off hock, and therefore, I am of opinion, that he is unsound.*

(*Sd.*) *A. B. C., V.S.*"

Here we have (a) the circumstances of the examination, (b) the description of the animal examined and (c) the result of the examination. We have now to deal with (b), and find that it comprises record of **Colour, Caste, Sex, Height, Age** and **Marks.**

Colour comprises the general hue of the body and that of the extremities, which are usually somewhat darker than that of the general surface, as also the under part of the body with interior of the limbs.

Colours of horses vary much, and some require the eye of an artist to describe them. However horsemen have certain terms used for the most common colours which may be grouped into **Uniform, Intermingled** or mixed, and **Parti-Coloured.** The Uniform colours range from white to black, and the principal kinds and points to be observed about them are as follow ;—

White (*Suffed*) horses are sometimes albinoes *i.e.* deficient in natural pigment of the body, having wall eyes, red pupils, imperfect sight in bright light, and delicate constitution ; others are simply white in colour, they are lymphatic in temperament, rather delicate of constitution and soft of hoof. Some have dark points, and others have the muzzle and heels of an ugly pink colour.

Cream-Colour (*Nookra*) is well known as that of the breed of horses specially used for the State carriages in England. These are of Hanovarian extraction, bred at Hampton Court.

Dun (*Chumpa or roja*) is a light brown as seen in Norwagian and Kathiawar galloways. Strange to say it is generally associated with the marks called list, and shoulder-stripes. **Dun** horses are reputed hardy, and it is believed that it was the colour of the original breed of the horse.

Chestnut (*Soorang*) is a bright golden red, and from this the different **Light chestnuts** shade off to dun, while the **Dark chestnuts** (*mowá*) grow darker until they become almost **Brown** or **Black.** The exact colour in doubtful cases is determined by that of the points and especially of the muzzle. **Light chestnut** horses are frequently well bred but very liable to be weedy, washy, and deficient in staying powers.

Sorrel is a darkish mottled chestnut colour, which used to be frequent in Suffolk Punches.

Bay (*Koomade*) is brown mixed with red. **Brown** (*soor*) has not the rich red hue of the bay. These two colours shade off into one another and are often doubtful in particular cases, when the French system of speaking of Bay-Brown may be adopted, but if the muzzle is tan coloured *i.e.* like ordinary driving gloves, the horse is a brown. There are more horses bay than of any other colour.

Mouse-colour is like that of an ordinary donkey, *i.e.* slate blue, and is not seen in well-bred animals.

Black (*Mooski or Kala*) is a good cart horse colour, familiar in Life-Guards horses. They are of bilious temperament and lymphatic habit. Sometimes very well-bred animals are black, of whom bay, brown, and medium chestnut are generally preferred.

The principal **Mixed** colours are the **Grey** (*subza*) and **Roan** (*gurra.*) Of the **Greys**, we have :—

(*a*) **Steel-grey**, where a few dark hairs are thinly scattered through white, and the general surface of skin and points is black.

(*b*) **Flea-bitten grey** (*magzi*) in which there are spots of black, brown or chestnut on a white ground.

(*c*) **Iron-grey** (*Nila*) where a few white hairs are scattered among black.

(*d*) **Mottled-grey** is iron-grey with rings of the darker colour.

(*e*) **Dapple-grey** (*guldar*) is grey spotted with white.

Of the **Roans** we have :—

(*a*) **Silver roan**, which is blue looking, with white and black hairs uniformly diffused over the body.

(*b*) **Golden roan** is an uniform mixture of white and chestnut hairs.

(*c*) **Red roan** (*rumani*) is an uniform mixture of white and bay hairs.

(*d*) **Strawberry roan** (*rumani*) is an irregular mixture of grey and red roan generally somewhat mottled and in patches.

Parti-coloured horses are those having patches with well defined margins of different colours, and the most common are :—

Piebald (*ablack*) is in patches of black and white.

Skewbald (*ablack*) is in patches of chestnut or brown and white.

These must have the patches evenly distributed over the body, otherwise we describe the most predominent colour with patches of the other *e. g.* white with brown patches, or a chestnut with white mane and tail. The art of description depends much on hitting on the most characteristic and promptly detectible features of the animal.

It is an old saying, that a good horse cannot be of a bad colour, but a dealer in India knows well that a horse is often objected to for nothing but his colour, and in consequence it frequently influences his price. Light-coloured horses, such as duns, and silver grey are supposed to possess less strength and endurance than those of a darker colour. Grey is a handsome colour, but is more liable to melanotic tumours. The dark brown and the bright bay, with black legs, mane, and tail are the favourites for the the saddle.

White points and patches are so common that they are used in describing horses, as **Marks** with special names, of them we may notice the following :—Of the head (*a*) **Star** is a white spot on the forehead, and may be faint or conspicuous. (b) **Reach** when a white line from the star is elongated towards the nostrils. (c) **Snip**, when the white mark enters the nostrils. (d) **Blaze** includes star, reach and snip, all these being large, and if these are very large, it is called **White face.** (*e*) Upper or lower or both **Lips** white or partly white. (*f*) **Poll mark** is a white spot at the poll.

Of the limbs :—(*a*) **White foot**, when it extends to the fetlock. (*b*) Hoof wholly or partly white. (*c*) White coronet or heels. (*d*) **Sock** or half-stocking, when it reaches the middle of the cannon. (*e*) **Stocking**, when it extends to the knee or the hock.

Of the body :—(*a*) White belly. (*b*) Saddle-marks, *i.e.* white patches under the saddle. (*c*) Girth marks. (*d*) Collar marks. (*e*) Wither lock. (*f*) Rope marks on hocks and pasterns. (*g*) Grey hairs at the root of the tail.

Thus if we get a good idea of the colour and marks of a horse, we shall be able to describe a particular horse *i.e.* distinguish him from others.

Natives of India attribute a great importance to the marks of a horse, so that the price is greatly influenced, and in selection of a horse, colour and marks are too frequently looked at, rather than other merits and performances. A good horse with the so-called unlucky marks may sometimes be picked up very cheap, and on the other hand, a favourably marked horse may be almost priceless. "**Punch Kalian**" *i.e.* a horse with white face and four white legs, is much valued in India by the natives. This importance is extended to the distribution, size and position of those peculiar changes in direction of the hairs known as "feather marks" seen on the different parts of the body, which may or may not be lucky. The following is a brief description of **Feather** or **hair marks** on the body of a horse:—

I The **Lucky Marks** are :—

(1) Two on the forehead beside each other in a line from one eye to the other above the angles, called "**Torun**" *i.e.* anklet.

(2) One between the throat and the breast along the line of the trachea, called "**Deobund**" *i.e.* having control over giants and evil spirits. If this mark is present, other unlucky ones are of no consequence.

(3) A bay, chestnut, black or other coloured horse with star, reach, snip or blaze and four legs or pasterns white, is supposed to be very lucky and is called "**Punch Kallian**" *i.e.* five buds.

II. **The unlucky marks** are :—

(1) Two on the forehead longitudinally situated one above the other called "**Behera Chud**" *i.e.* breaker of water pots.

(2) Two on the forehead, one above the other, but the upper one inclined to the left or right direction called "**Behera Fore**" *i.e.* breaker of water pots.

(3) One situated a little or about an inch below the line of the angles of both the eyes called "**Ansoodha'r**" *i.e.* tear flow.

(4) When there is one on one side of the neck and absent on the other, or when there are two on one side and one on the other, called "**Sa'pun**" *i.e.* snake. Both these are most unlucky.

(5) When there are two on each side of the neck called "**Tha'thri**". Only a few consider this unlucky.

(6) When on the breast in the centre or on one side, called "**Urdamul**".

(7) When on the withers called "**Peth Sa'pun.**"

(8) When underneath the chest, situated at the girth called "**Gome**" *i.e.* alligator. It is supposed to be the most unlucky.

(9) When on the belly between the sternum and the sheath, called "**Gungapa't**" *i.e.* breadth of the river Gunga or Ganges.

(10) When on the outer side of one fore-arm and absent on the other, or if present on both legs, and if the turn of the hair is from below upwards called "**Khila Oopar**" *i.e.* destruction.

Unlucky marks on the body of a mare are considered of no consequence.

III. The marks which are neither lucky or unlucky are :—

(1) One on the forehead, situated above the angles of the eyes called "**Raj Bhamro**" *i.e.* royal mark.

(2) One on each side of the neck along the side of the crest between the poll and the withers, called "**Doa Bago**" *i.e.* two reins.

(3) One on the outer side of each fore-leg, the turn of the hair being from above downwards, called "**Khila gar**" *i.e.* drive a nail.

Of the artificial or accidental marks, the following are worthy of notice :—

(1) The scar or blemish outside the nostril of Persian horses.

(2) The slit false nostril of donkeys.

(3) Slits, punched holes or laceration of the external ear.

(4) Numbers branded on the side of the neck, as was seen in stud-bred horses, and now in up-country horses in India. Stud-breds are now branded under saddle.

(5) Brands of numbers, letters, or devices seen on the shoulders, quarters, and under the saddle in Australian horses. Much importance is sometimes attributed to these brands, and purchasers and dealers are very learned in them, but no brand whether of shippers, breeders or dealers, can make a good horse a bad one or *vice versa*, so ordinary purchasers will do well to put no faith in them. An "**R.**" or "**R. V.**" on quarter, or under flap of the saddle

must be looked upon as very suspicious, and one having to do with a "caster" or horse rejected from army service or the stud or the depôt, for vice, &c. Sometimes these letters are ingeniously converted into good brands. Some few Australian horses are seen without the brand, which is accounted for their being paddock-bred. On Persian horses we frequently find Persian or Arabic letters branded especially on the quarter, and both these and the Arabs may have short transverse marks of hot iron over the vena saphena.

(6) Blemishes and brands resulting apparently from treatment should always be noticed in description, especially marks on the knees.

(7) Rope marks round the pasterns from shackles are very common in country-bred, Indian and other oriental horses; and Arabs and Persians frequently have marks showing they used to be picketed with ropes above the hocks. In Persia and Punjaub they put on metal shackles and heavy padlocks to prevent horses being stolen.

(8) **Saddle-Marks** are generally seen in old horses, and they, like other galls, may be simply patches of rough or white hair, and in other cases they are actual scars.

(9) A horse who has been accustomed to wear bandages may have such marks about his legs, which should lead to careful feeling of the back-sinews.

We must also observe

(*a*) the **List** or dorsal stripe of a dark colour extending along the centre of the back as is seen in asses, mules, and horses of some special breeds

as characteristic *e.g.* Kathiawar horses. From this may run down.

(*b*) the **Shoulder stripe** or stripes parallel with the skin of the scapula.

(*c*) Zebra marks are transverse dark skin markings seen especially outside the knees and hocks. They are most frequent in duns and light-chestnuts.

(*d*) Dark stripes in unusual situations, conspicuous marks of injury, and even such transitory marks as numbers branded on the hoof should be mentioned in description. The maximum time these letters will remain is about 7 months.

CASTE.

Caste is the verbal equivalent in India for **Breed** in England, and it means variety of race of the animal. Many countries of the world have their native race (country-breds) of horses, and these when transferred from one place to another become imported horses. A race whether native or imported, which is for several generations carefully regulated in breeding with a view to its becoming suited to special requirement, may either be an improved breed, the result of crossing or the result of selection. The latter is a true breed, and the Arab, English Thoroughbred and American trotter are examples of true breeds imported by artificial selection *i.e.* by intentional regulation of breeding by man. The Kathiawar horses, Burmese ponies, and Norwaygian ponies are true but unimproved breeds, for they have attained their useful qualities by natural selection, the results of which are more solid and permanent than those of artificial selection, but less advantageous and rapid. There is much difficulty in deciding which are true varieties as compared with simple families, with distinct species on one hand to separate species on the other. This subject is altogether too long to be dealt

with here, but we may hastily run through the characteristics and facts concerning some breeds of horses met with in India.

The **Country-bred** (*c. b.*) varieties in different parts of India:—In most parts, the country "*tatoo*" or pony is common and used for all sorts of work. He is hardy, strong, wonderful in his powers of endurance, and living where another horse would starve. He is tractable enough but quite untrained, is treacherous and ill-natured in his habits. His colour is perhaps most commonly chestnut, but it varies much, and parti-colours are frequent. In northern India, especially the Punjaub and also in some of the leading native states of southern India such as Hydrabad, Mysore and Kohlapur, larger horses are seen. They are hardy and enduring, but deficient in shape, temper and proportions. They have resulted from the war-like tendencies of the Mahomedans, Marathas and Rajputs, necessitating horses for predatory and cavalry purposes, but latterly have shown a tendency to decline, hence Government with a view to the supply of horses for cavalry and artillery, have done their best to encourage horse-breeding. Firstly the Indian stud system was tried and efficiently organised by the celebrated Veterinarian and traveller Moorcroft, and afterwards Veterinary Lt.-Col. J. H. B. Hallen, C. I. E., Inspector General Civil Veterinary Department in India, who may be worthily styled the father of Veterinary profession in India, and whose retirement from service in May 1894 is a great loss to the Department, was entrusted with the organisation of the present highly valuable system of Horse-Breeding Department, which has no doubt turned the current of degradation of the Indian Country-bred.

Stud-bred horses are now becoming extinct, the few remaining being the fittest which as such have survived, and are apt to be taken as representatives. Evidence tends to show that such horses as could be turned out from the

studs, fit for army purposes, were excellent all round animals, with good subsistance and power of endurance. The studs have left their mark on the horse-flesh of Upper India in the form of improved size, substance, soundness and good limbs due to the admixture of Arab and English blood. The improved **Country-bred** is the produce by Government sires (stud-bred or imported) out of country mares, many of which have a good deal of English blood obtained from stud sires or dams, grand sires or grand dams. There were many defects of the country-bred, which have long been met by crossing with the Thoroughbred (Tb.) English horse, the characteristics of which will be described later on. Also Arab blood has been much resorted to for crossing with country blood with a view to improvement of limbs.

In the Bombay presidency especially, we find the Arab-cross very strong in such a degree, that some so called country-breds are in mark and shape practically country-born Arabs. Laterally the English cart horse has been imported by Government, to give to country-bred stock, bone and substance. The Norfolk trotter has been especially selected for this purpose as being a variety of cart-horse which has been "bred true" for many years, and thus become able to transmit its qualities to its offspring. The type of a Norfolk trotter is not over **15** hands **2** inches high, with extravagant action, which varies from the rate of **14** miles to **17** miles an hour for short distances. Their weight renders long distances at a great pace on hard roads impossible. Silver and red roans are favourite and hereditary colours. They are used for breeding when more strength is required, and especialiy when harness-action is an object. Their worst point is the small measurement below the knee. There can be no doubt that the Norfolk trotter has made a useful impression on the breed of horses in many parts of the country, especially in the Punjaub. Some indigenous breeds once celebrated have

disappeared from India, such as the Bheematurn of the western Deccan, and the Kathi of the North West Provinces. Of the few remaining we notice (*a*) The Kathiáwár horse. (*b*) The Baloochi. (*c*) The Burman pony.

Various native states are doing good service by studs, government sires, and subsidies, to improve their breeds of horses. Thus we begin to hear of Nizam's and Kohlapur's country-bred horses and so on. Others are happily endeavouring to improve and keep pure the indigenous breeds, an effort in which the Káthiáwar chiefs have shown a good example. Care in breeding, castration of weedy sires, ample feeding of young stock, removal of shackles and multiplications of horse-runs must be looked to as a means of improving the breeds of horses in India. The value of new blood is admitted in many cases, but the Arabs among horses show what an amount of good can be done by selection as opposed to crossing.

Of horses imported into India for working purposes &c., we may note :—

(1.) **European** :—English, Thorough-bred and Hungarian.

(2) **Asiatic** :—Egyptians, Cape, Arabs and Persians.

(3.) **Colonial** :—Australian or Walers and New-Zealand.

(4.) **Americans** :—South-Americans.

(5.) **Northerns** :—Heratin, Turkoman, Kahandharis, Cabulis and Tibetan ponies.

(6.) **Burmah** :—Burmese pegu ponies.

Of these the Thorough-breds, Arabs, Persians, Australians and some of the Northerns must be noticed in detail.

(1.) The **Thorough-bred** :—" Thorough-bred " means that a horse's pedigree can be traced for generations from sires and mares of English pure

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blood, or from Arabs, Barbs, or Persians, recorded in the English "Stud Book." The English thorough-bred, as we now find him, has undoubtedly been created by judicious crossing with various breeds, the Arabian and Barb predominating. It is a fact that he is far superior to any breeds of horses, a result of careful and judicious breeding, carried out in such a perfect manner as would be impossible to excel, combined with climatic influences, which has caused the British race-horse to be what he is—the admiration of all lovers of horses—in every quarter of the globe to which he has found his way, where he has beaten in the race, every antagonist on his own ground. His average height is from 15 to 16½ hands. His characteristic points are:—Lightness of the head and neck which is also long, the forehead wide and convex, muzzle fine and small, with ears pricked and fine but not too short, the crest thin and wiry, body moderately long, and the back muscular, with good wide hips. The chest well-developed but not too wide and deep, the fore-quarters well set on to the chest but not too thick between the upper ends of the shoulder-blades. The arm long and muscular, the elbow set on straight and not tied to the chest, the fore-arm also muscular and strong, the knees broad and strong, with the bony projection behind well-developed, legs flat and long and pasterns slightly sloping, with sound feet. The bones of the hind quarter are long, and the hocks bony and strong, possessing the ability of being freely straightened out, as well as bent. The pasterns moderately long and oblique, and the bones beneath the hocks,

flat and free from adhesions. The loins flat on account of largely developed muscles. The withers high and running far back. The mane and tail silky in appearance and the hair straight and not curly; curly hair being generally looked upon as a sign of an admixture of impure blood. Thus he possesses physical qualities in bone, in muscle, and in skin, which is also soft like velvet.

(2.) **The Arab horse** :—The best Arabian horse does not as a rule exceed 14 hands 2 inches in height. There are three distinct breeds of Arab horses, *viz.* (*a.*) *Attechi*, which does not rank high in general estimation; (*b.*) *Kochlani*, highly prized, and very hard to procure; (*c.*) the *Kadischi*, a mixed breed. Although Arabs are not good race-horses, they are excellent hacks, and particularly excel as light cavalry troopers. A son of the Desert of the best type has a handsome and intelligent head, with broad forehead; large, "kind" eyes, straight or concave line of the face, large nostrils, fine muzzle, well carried ears, and lean and wide jaw. His, neck is well set on to his head, with a good crest, is carried bravely, and is fairly long. His shoulders are well sloped, fore-arms muscular and well-developed, capital legs and feet. His withers are somewhat low and thick. His loins are flat, broad and powerful. For roundness of barrel and length of back ribs, for levelness of croup and for beautiful carriage and peculiar high setting on of the tail, he is certainly without equal among horses. He is frequently higher over the croup than at the withers, which, in that case, has a tendency to be unduly low and thick. His hocks and gaskins are

not as good as those of a well-bred English or Australian horse. The heaviness of his fore-hand is due to the large size of the muscles which attach his shoulders to his chest, and which draw the fore-limbs forward and backward. The comparatively large development of the muscles of his fore-hand and loins, makes him a good weight-carrier for his size. The nice and large barrel of the Arab plainly indicates that he has clear wind, strong constitution, and that he is a good "doer." No breed of horses has such a hardy constitution as the Arab, and stands the alternations of temperature, heat and rain so well. Thinness of the lower jaw at its angles is a sure sign of pure desert blood.

Pretty stories have been told about the familiarity existing between the Arabs and their steeds—how the foal at its birth is caught in the hands of the by-standers, not allowed to fall to the ground; how it plays with children of the house; eats and drinks with its master; how he tends it when indisposed, whilst it no doubt returns him a similar service when required. That the Arab horse is much gentler, and in a general way more intelligent than the close-stabled animal of England, is quite true. Brought up in close contact with men, and enjoying the comparatively free use of his senses and limbs, the Arab is in a fair way for developing to full advantage, whatever feeling and instinct, good blood brings with it. No one can afford blood mares of the three great Arab races. Several men buy and have a share in one, like a company, and they divide the profits of her offspring. No Arab dreams of tying up a horse by the neck; a tether replaces the halter, and one of the animal's hind-legs is encircled about the pastern by a light iron ring, furnished with a padlock, and connected with an iron chain about 2 or 3 feet in length, ending in a rope which is fastened to the

ground at some distance by an iron peg. Such is the customary method, but should the animal be restless and troublesome, a fore-leg is put under similar restraint. It is well known that Arab horses are much less frequently vicious or refractory than other breeds, and this is the reason why Arab geldings are so very rare, only castration is seldom performed because not otherwise necessary, and tending of course to diminish the value of the animal. The following is a poetic and romantic description given by an European traveller about Arab horses :—* " Never had I seen or imagined so lovely a collection. Their stature is indeed somewhat low, and none comes fully upto 15 hands; 14 hands seems about their average, but they are so exquisitely well shaped that want of greater size seems hardly a defect. Remarkably full in the haunches, with a shoulder of a slope so elegant as to make one, in the words of an Arab poet, 'go raving and mad about it,' a little, very little saddle-backed, just the curve which indicates springiness, without any weakness, a head broad above and tapering down to a nose fine enough to verify the phrase of drinking from a pint pot, did pint pots exist in Arabia ; a most intelligent, and yet a singularly gentle look ; full eye ; sharp, thorn-like, little ears ; legs fore and hind that seem as if made of hammered iron, so clean and yet so well twisted with sinews ; a neat, round hoof, just the requisite for hard ground ; the tail set on, or thrown out at a perfect arch ; coat smooth, shining and light ; the mane long, but not overgrown or heavy ; and an air and step that seems to say, 'Look at me, am I not pretty ?"' This description of their appearance justifies all value, all reputation and all poetry.

(3) **The Persian** or "**Iranee**" **Horse**:—The Persian horses range in height from **14·2** to **15·2** hands. They are shapely horses with the exception of ears which are large and loose, their joints being closely knit ; their quarters well

* Sidney.

developed, but they lack spirit. He ranks perhaps next to the Arabian, being his equal in speed, though not in staying qualities, but is hardy. The Persian horse has been prized for ages, and enjoys a much more ancient reputation than even Arabian horses, and formerly constituted very often the gift of kings, when the Persian cavalry were the finest in the world. The native Persian horse has, however, degenerated of late years. But in some parts of Persia great attention has been paid to breeding horses, where some noble families have kept possession of a particular breed, which it is customary when young, to brand on the buttock with a distinguishing mark to denote noble descent. The most highly prized race bear the name of "Shalokh", being more remarkable for their speed and strength than their beauty. The Persian is one of the best animals to be purchased in Bombay as a hack and carriage-horse. Government used to buy them to mount the dragoons and artillery. They are better roadsters and chargers, and stronger than the ordinary run of Arabs. He is coarsely-built, his eyes are not so prominent and good looking as that of an Arab ; the string marks inside the ears found in Arabs are absent; his muzzle is not so small as that of an Arab ; the neck is coarse, well crested, not so well set on as in an Arab ; his legs are short and powerful ; and there is generally a brand mark in Persian character on the quarter.

(4.) **The Australian or Waler Horse**:—These are called Walers, because it is an abbreviation of New South Wales, a colony of Australia.

Their average height is 15·3 hands. They are of cross breed with thorough-bred sires imported from England, and of late years some very fine Arabs have also been imported by Australian colonists. There is a considerable trade in the export of Australian horses to India, especially Bombay and Calcutta, where they are bought by Government for remount and other military purposes; and also by the enterprising Tramway companies. For the first year after their arrival in India, they cannot bear the heat and other climatic changes, so they are worked only in the cool time of the day, but once acclamatized they show good power of endurance. The special good points of Australians from a saddle point of view, are their excellent flat shoulders, light necks, well shaped legs, and sound feet. Their loins, barrel, and croup are not, as a rule, as good as those of English or Arab horses, but they are able to stand nearly equal work. Their light forehands and good shoulders make them good jumpers, but they have the reputation of being vicious, and especially for a trick of spitefully jumping, called "**Buck-jumping**." The breed has not placid temperament of the Arab horses, and will not bear any brutal treatment. Time and labour being precious in the colonies, each animal is broken by force in a few days. He is handled, lounged, backed and turned out a "made horse"; broken in spirit or a "buck-jumper" for life. They become useful chargers and hunters and even artillery horses. The breeders always apply their brand marks either on the shoulder, neck, quarter or under the saddle. They are almost always gelded, with

a view to prevent others from using them for breeding purposes. The head is coarse and the animal is not so intelligent as an Arab. His croup is generally slanting and the tail set on low. The coat and hairs are rough and coarse. Their feet are broad and large. Their withers are very high and prominent.

(5) **The Turkoman horse** :—This variety of animal which is indigenous to Turkistan, is a larger breed of horse than either the Arabian or Persian, measuring from 15 to 16 hands. They have been celebrated from the earliest times for the wonderful amount of endurance they possess. They are, however, badly shaped, being too long in the legs, with a large coarse-looking head, and are often ewe-necked, although they are possessed of such good qualities as to command high prices even in their native country, though destitute of that compactness of form and beauty which distinguishes some of the best breeds, being leggy and narrow-chested and not well ribbed up. The Turkoman is quite as gentle as the Arab, and generally more quiet and sedate in his ways, and on the whole equally courageous. He appears quite thorough-bred and is more like an English race-horse. The term ponies is applied to every breed of horses in Asia, including Arabs, except Turkomans. He is about the only animal that comes up to the idea of a horse, averaging 15 hands. Their ears are peculiar, small, pointed, and turning inwards —a peculiarity noticeable in many Punjabee horses.

(6). **The Kathiawar horses** :—This breed of horses is indigenous to Kathiawar, a province on the

west coast of India, about 300 miles north of Bombay. It is governed by about half a dozen princes, who are very fond of horses, being also best riders. Most of these princes have got their own studs, and are doing their best to improve and keep pure their indigenous breeds—an example which ought to be followed by each and every native state of India. The Kathiawar horses are generally parti-coloured, with various marks on the body. Their face is rather long and coarse-looking, their ears close together, set up high on the head, with their points directed inwards when they are pricked forward. Having been brought up among rough surroundings, they are capable of enduring much privation and hard work. They generally have a list and zebra marks when of a dun colour, which is very prevalent. They have drooping croup and quarters with ill-carried tails, and legs long below the knee. They are very fast going animals, and the mares are highly prized for their speed like a steam-engine, and hence largely used by decoits called Barvatias, who after playing a havoc in one district on one day, are seen hundreds of miles away the next day, thus quite out-pacing their persuers. These animals are generally of a vicious temperament.

(7). **The Burma pony**:—This variety of ponies is chiefly bred in the Shan Hills, and he is generally called a Pegu pony. He rarely exceeds 13·2 hands, and is probably at his best when about 13 hands high. He is a grand weight-carrier, jumps well and is very hardy. He is a nice trotter with short steps, which is

very pleasing to observe. He has a small head, thick neck with large mane, goose-rumped, small upright feet, and coat coarse and rough. He is generally gelded.

SEX.

A female of the horse tribe under 4 years is a **Filly**, and a male is a **Colt**; over 4 years they become mare and horse respectively. When very young they are spoken of indifferently as **Foals**. The male animal, by the process of emasculation, cutting, altering, gelding or castration *i.e.* surgical removal of the testicles, becomes a **Gelding**, when the operation is thoroughly performed. But when one testicle only is removed, he is called a **Rig** and when the epididymis has been left, the animal is said to be left "proud," as having somewhat of the unmutilated male (stallion or entire horse) as regards temper and sexual inclinations. The operation of **Spaying** *i.e.* removal of the ovaries is practically never performed on the mare. In examination of a horse as to soundness, we must be particular to distinguish rigs from geldings and entire horses, and to note any traces of **Hermaphroditism** *i.e.* characteristics of both male and female animal, which is apt to be associated with barrenness. In selecting animals for stud purposes, we must not forget to make a special examination as to perfection in development of the generative organs, the mare especially requires to be "**Roomy**" *i.e.* to have a good width of pelvis, and the temper, likely to make her a good mother. The different sexes differ in temper, stamina, and make. The stallion, in pluck, power, endurance, length of teeth especially the canines, size of chest, length of mane and tail, stoutness of neck, fore-hand, loins and quarters, exceeds the mare; but his tendency to neigh on scenting mares or other horses, and fight as well as "take it out" of himself and the rider in various ways, lessens his value as a war-horse especially in the ranks. The mare has her drawbacks in

liability to œstrum or "heat," which makes her skittish at times, and nervous than the horse. The gelding has less pluck and "go" than either the horse or mare, but is more docile and quiet, goes well in the ranks or in harness, is not led away by sexual appetite, and is of good shape for work. An animal being a rig is a nuisance, he may be impotent but with sexual desire, or may be frightful and get a number of mares in foal at the wrong time by getting loose in the stable or lines.

HEIGHT.

Height has attained special importance, because it has somewhat erroneously but conveniently been taken as a creterion of power, both in purchasing for government purposes and for racing. The **Height of a horse** is the distance in plumb line from the highest point of his withers to the ground, and is taken by means of an instrument called the **Measuring standard.** This consists of an upright, a cross bar or beam, a graduated scale, and a spirit-level. The upright has the scale on it divided into hands, inches, and eights of an inch; each **hand** being four inches. A complete standard should be graduated from 7 to 18 hands, but one ranging from 12 to 17 hands answers all practical purposes. The upright may be square or round, and the beam plays up and down on it evenly without noise or jerking, and reading on properly directed pressure. The best instruments work by rack and pinion. The lower edge of the beam, where it plays on the upright, should sharply and without any doubt indicate the height on the scale. The foot of the upright should be flat, and a plumb weight hangs on the upright so that its perpendicularity may be ensured, but the spirit-level suffices as a guide to this. Old standards are sometimes worn at the ground end, so the instrument should be periodically tested. Sometimes for convenience in packing, the upright is made of two parts which are screwed together, but this is an evident

possible source of error, for an interested and unscrupulous individual (of whom in the matter of measuring the number is legion) may act at the standard, and while admiring it, give it a turn or two. A rough and ready method of taking the height of a horse is by seeing how far up on the chest of the measurer the height of the withers comes; most horsemen know, for example, what height on themselves measures 14 or 15 hands, or pony height which is 13·2 hands. By practice or instinctively some people acquire a good eye for height, and estimate it to within ¼ inch at a glance. The beam should not "dip" at its free end, it should fit evenly on the upright and be sufficiently rigid but light in its pressure on the withers. It should bear the spirit-level, preferably a circular one.

A horse receives in racing language different names according to its height, *e.g.* if under 13 hands he is a **Liliput**, if under 13·2 hands he is a **Pony**, if between 13·2 and 14 hands he is a **Cob** or **Galloway**, and if above 14 hands he is a **Horse**. These heights are fixed arbitrarily and liable to variations, thus the height of **Polo ponies** is officially raised to 13·3 hands in India. Arabs having low stout withers usually measure low, and thus one of them with the build of a horse may have the height of a galloway. Some horses such as Thorough-breds and Walers having very high withers, measure high for their build and structure. These are facts to be remembered by the general purchaser, and as concerns the "all round horse" or "general utility horse," as it has become the fashion to call *him*. Yet height as height tells, and a perfect big horse is better than a perfect little horse, because weight (to be carried) is fairly regulated by inches in height. But the element of age is considered also. A horse is generally considered to have stopped growing at 5 years, and so it is to the interest of an owner to get an animal which has passed the standard as a pony aged 5 years, because a certificate to this effect will enable him always to run as a pony. But

now, horses undoubtedly thought nearly full grown at 5 years, increase a couple of quarters of an inch after that age, and if liberally fed, and "well done" and not over-strained, may even grow more. It has also been noted that changes of climate especially from temperate to torrid zone has a stimulating effect to the growth.

Besides a good and reliable standard, we need a proper **Measuring place, Reliable measures,** and **Proper position** of the animal. A measuring stone should be level and constantly tested as to its levelness, it should be slightly roughened to prevent slipping, and have no sand or small stones thrown on it, and should not wear too readily. It may have a fixed standard across it, but the movable standard is on the whole better. The animal's head should be held by a reliable and uninterested man in a natural position, neither too high nor too low, and a little tact or green grass may be necessary to keep the horse quiet. The fore-legs must be level and the feet evenly rested on the ground. Some horses are taught to stand with their feet a little forward, or diverging when gentle pressure is put on the withers, others cringe slightly under the standard, which may make a considerable difference in results. An assistant not belonging to the animal should from the off-side handle the fore-legs, and place them properly in position and keep them there. The measurer should stand against the near shoulder, keeping the measuring-standard as inconspicous to the animal as possible, but if he obstinately refuses to come near it, let him have a sniff to see that there is no harm in it. The standard should be in the right hand and the beam well raised above the probable height of the animal, then the left hand should play a little time on the withers to part the lock of hair, to ascertain the highest point, and accustom the animal to the pressure. The upright having been firmly planted on the ground near the left shoulder, the beam may then be brought gently down

until it rests on the withers, and can be moved easily backwards and forwards. Everything then being correct, the animal standing properly, the bubble in the centre of the level, and the head in natural position, the beam may be fixed on the upright by a twist of the screw or pressure on the spring, and the instrument removed, and "reading" obtained, is recorded. The owner should be standing by and told the verdict. He should be given the privilege of three readings or of the first, in case of his demanding three he should take the average. There are so many elements of possible error about measuring that this principle is necessary. The observation must be made in public, especially in presence of two stewards when for a race meeting, and deliberately and in a quite unbiased manner; especially any remarks of by-standers as to previous measurings must be neglected. The practical measurer becomes expert in promptly taking the measure of animals directly they get into position and in ascertaining at once when all is correct.

There are so many interests involved in measuring that not a few dodges are adopted to lessen the real height of animals. The regulation by which an allowance was made for thickness of shoes has very sensibly been done away with, and the turf clubs are getting very charry of admitting the value of local certificates, in which errors in description, laxity in ageing and measurement, are apt to be very evident to occur. The most common dodges of preparing a horse for measuring less than his natural height are:—

(*a*) **Cutting down his feet.** This is legitimate, so long it is not done sufficiently to render him foot-sore. He should be in running condition when measured, which would prevent cutting down to the "quick" as is sometimes practised, and which not uncommonly defeats its object by rendering the animal incurably and permanently lame.

(*b*) **Drugging**, especially with Indian hemp. This does not hurt the horse, but it interferes with the condition and training, and thus defeats its own ends.

(*c*) A **Preliminary gallop to exhaustion.**

(*d*) **Walking the animal continuously for many hours.**

Most of the dodges could be met by measurement taken the day before the race, and by doing away with permanent certificates, but there are objections to both these methods, and solution of the difficulties in description, measurement, and ageing, may be left for solution by the different turf clubs, with a remark that an authoritative central regulation on all these three matters, is sadly needed and wished for, by all well-wishers of true turf interests.

AGE AND AGEING.

Horses live to the age of 25 and 30 years on an average, when left to the course of nature, but usually they fall victims to disease long before this. In determination of the value of a horse, it is very necessary to know his age approximately, and for racing purposes it is important to know it exactly. The general appearance of a horse is to an extent a guide, the old horse being less round in figure, and showing more marks of wear and tear than the young, the hollows of the temple are well marked in old horses, the movements become stilty, the back often is roached and stiff, white hairs about the temples, and such other changes indicate senility (old age). The well furnished frame of the adult contrasts markedly with the growing frame of the young horse. Pubescence or youth with sexual vigour is attained generally at about 2 years of age, and adultism at 8, when a horse is said to be aged; a horse is mature at 15; and about 20, becomes old. Differences in caste, amount of work done, and other con-

ditions influence the age of a horse as regards fitness for work. Thorough-breds mature earlier than coarser animals, and Arabs are proverbially late in maturity. The later a horse matures, the longer he will last before being cast as old and worn out. British army horses are trained at from 3 to 4 years, work upto 15 years, and are then cast for age.

A colt or filly is a **Yearling** when over one year and under two years; and a horse remains four years old until he attains five years, and so on, but when under four years and six months he is called "**Four off,**" and when over four years and six months and under five years, he is called "**Rising five,**" and so on. The term "**Rising**" is, as a rule, applied to a horse's age, when it is less than that which is stated; and "**Off**", when it is more. The former is used when the birth-day is comparatively near at hand; the latter, when it has recently passed. Thus a horse "rising five" is a four year old which is nearer five than four, and an animal "four off" is a four year old that is nearer four than five.

Different horses date their birth from different times of the year, according to when they are most likely to have been foaled, thus a Thorough-bred horse's birth-day and that of an Eastern horse, is now fixed at 1st January, so that a Thorough-bred colt born on 31st December 1893, is a yearling on 1st January 1894, his number of years old being the number of new year's days he has seen. Most English horses date their birth from the 1st May, and the Australians from 1st August. In India, Arabs and country-breds are aged from the 1st January. A horse is aged according to the birth-day which seems to be nearest to the official birth-day, thus an Arab on 1st January 1894 might really according to his mouth be 4 years and 9 months, but would be put down as 5 years old (an early one), when the error would only be an over-estimate of 3 months, whereas if called as 4 years old, the under-estimate would amount to 9 months. A very common

error, especially among racing men, is ageing according to the number of milk-teeth in the mouth at a particular time,—a most erroneous system. The age is judged by the teeth accurately for young horses fairly well, and sufficient for all practical purposes in the case of older ones, but the opinion must be arrived at from a consideration of all the conditions of the teeth, and not from the so called "marks" only. As regards ageing, also it must be remembered that we merely give an opinion of what we judge to be the age from the state of the mouth. We cannot swear to age, but we can swear to what opinion we form of age from the state of the mouth, and any carelessness in forming such opinion, especially defective observation, is culpable. Hence it is the more necessary in the rush and hurry of ageing a number of animals for a race meeting, to proceed cooly and carefully, balancing all evidence obtainable, and any documentary evidence, especially stud-book-entries, must be accepted in preference to an opinion. The veterinary practitioner must especially be careful in proceeding carefully and on fixed system in judging months, as it is a common trick to get him to look at the same mouth under different circumstances, with a view to get a conflict of his opinion. The date when the ageing is being performed must especially and constantly be remembered. Each act of ageing is a distinct and complicated mental effort, therefore the practitioner does neither himself nor the owners of horses justice, if he examines mouths after he begins to feel fagged or tired, especially under a hot sun. The most dangerous attempts to "rush" the professional man for an opinion, are those called for in a hurry when he is occupied in doing something else. A "fresh mouth" is one retaining all its marks unusually clear, and hence looking younger than it really is; on the other hand the mouth of a hard-fed animal or a crib-biter may have the marks lost early, and so convey an erroneous impression of age. The mouth of a mare is usually a little more forward

than that of a horse, and the incisor teeth slant forwards. A full mouth of 24 milk or first teeth must not be mistaken for that of a mare losing the marks of her permanent incisors, a mistake which seems rediculous enough, but has been often made. The tushes or canine teeth are of little value in determining age, they are often replaced, but in the living animal the milk-tushes are not often seen because their crowns remain buried in the gum. In the prepared skull of a young animal under one year, they or their alveolar cavities may be seen plain enough in 6 colts out of 10, especially Thorough-breds. Canine teeth of geldings seldom become long and large, in the mare they are absent or rudimentary, in the stallion they sometimes grow to great length, but generally in old animals become rounded not by mutual wear but by friction of the bit. They are simple teeth and therefore have no marks. The molars and incisors are compound teeth *i.e.* they form surfaces called **Tables** which meet the corresponding parts of the teeth in the opposite jaw. These tables are depressed to from hollows known anatomically as infundibula (funnel shaped), and to horsemen as the **Marks,** which alter in depth and shape by wear, being easily distinguishable by their black colour. There are several marks on the table of each molar, but only one to each incisor. Each tooth is composed of three tissues *viz.* :—(1) **Enamel,** which is the white shining substance, being the hardest tissue of the body. It is protective. (2) **Dentine,** which is the bone-like substance forming the greater part of the tooth situated inside the enamel, and forming the whole of the fang. (3) **Crusta Petrosa** or cementum completely covers the imbeded portion of the tooth, and occupies the cavities on the free portion. It forms a kind of scaly investment of the enamel, thickest towards the roots, most plentiful on the molars, and is of a brownish yellow colour. These three substances being of different degrees of hardness, wear to various degrees, and so the surface of the molar tooth

especially keeps rough and suited for grinding grain and fodder. The development of teeth requires brief notice here. There are generally two sets:—(1) The **Milk, temporary** or deciduous teeth. (2) The **Permanent** or horse's teeth. The incisor teeth are all replaced *i.e.* first a milk-set appears and then permanent teeth which displace the milk-teeth, and cause them to fall out. The milk incisors are smaller and whiter than the permanent ones, have distinct necks, and have no longitudinal grooves on the front of their crowns, and their marks are shallower than those of the permanent set. These latter so appear as to force almost the entire milk-tooth out of the mouth. The permanent molars, however, grow gradually under the temporary ones, and the latter are slowly absorbed, until a thin piece of tooth-table is shed when the permanent tooth is ready for use. Only the first three of each set of molars above and below are replaced.

The time of eruption and replacement of the teeth of the horse is as follows :—

Teeth.		Temporary.	Permanent.
Incisors	Central	Present at birth	2½ years.
	Lateral	1 to 2 months	3½ years.
	Corner	6 to 9 months	4½ years.
Canines or Tushes		.....	4 to 5 years.
Molars	First	Present at birth	2½ years.
	Second	One month	2¾ years.
	Third	Three months	3¼ years.
	Fourth	.....	1 to 1¼ years.
	Fifth	.....	1½ to 2 years.
	Sixth	.....	4½ years.

The wear of the incisors causes an alteration in shape of their tables, and at the same time a change in shape and gradual loss of their marks. Thus a permanent incisor has at first a sharp edge higher in front than behind, shelly as it is termed, and unworn, and the infundibulum is well defined and uncoloured. First the prominent edge becomes worn down, then the posterior edge, and thus

the table is formed. At this stage the wearing surface is elongated from side to side, and the mark becomes eliptical, and also black from tartar and accumulated partibles of food. Later the mark becomes oval, then triangular and circular, and finally it is altogether lost. The secondary mark appears in front of the remains of the infundibulum in old teeth, it is dentine which has been formed from the tooth-pulp, a process by which the pulp-cavity in the fang is gradually lessened in depth. A very old incisor is simply a fang separated to a distance from its neighbour, and mouths of very old horses have been seen, where the incisors had become completely lost through the effects of age.

Length of tooth is the proverbial expression for age in horses, but it is not invariably correct in this respect, for we very frequently see old animals with their teeth worn short. Age brings about an alteration in shape of the front of the jaws, whereby the incisor teeth are caused to meet at an angle, and the series of them becomes straighter. If we look in the mouth of a young animal we find that gums and incisors form an arch, whether we look from side to side or from above downwards. In the old animal the upper and lower incisors meet in front to form an acute angle, and each incisor series is straight from one corner to the other. The determination of age of horses is quite complicated enough naturally, but a form of that has arisen which consists in the making of artificial marks on the tables of the teeth by means of a sharp steel instrument and burning the artificial mark to blacken them. The process is termed "**Bishoping**" and some operators are skilful, and succeed in deceiving amateurs and careless persons, but the absence of a ring of enamel around each mark, the shape of the artificial marks, and the signs of occasional slips of the chisel scratching the enamel, are at once detected by the professional man. To pass a 4 years old horse for a 5 years

one, the corner teeth are punched out just before the 1st January, but this cannot affect the condition of the central and lateral incisors, and may even altogether prevent the corner permanent incisors ever coming up. Stewards of race meetings who do the ageing for themselves, are sometimes taken in by this rather hard device. What are called "**Irregular mouths**" require special care in examination. Sometimes milk teeth are retained, and in other cases, more or less than the usual number of front teeth are found in the mouth. In one case of a horse only 4 molars, on each side of each jaw were present and no signs of any more could be detected in the prepared skull. Sometimes the two sides of the mouth are unevenly developed, and either taken singly would represent a different age, however the general appearance of the mouth and the animal, will guide in all cases of doubt.

After 8 years, the animal is said to be "**Aged,**" and we must distinguish between this and "**Old**" age. The true age of an "aged" animal becomes more and more difficult to determine, and at last becomes more a guess work, thus it is best to speak of an animal as "about" twelve years and so on. In most practical purposes when a number of horses are being purchased it suffices to divide them into 3 classes:—(1) Too old. (2) Serviceable. (3) Too young.

A common idea, but a most erroneous is that the upper incisor teeth lose their marks one year later than the lower, whereas even in an old horse the upper incisors may be found looking quite fresh. The infundibula of these teeth are much larger than those of the lower jaw, indeed the teeth themselves are larger.

The age is usually determined by the appearance of the front teeth of the lower jaw.

The following formula will express the dentition at the different ages, (T—temporary, and P—permanent):—

At or shortly after birth:—2 central incisors (T), and the first molar tooth (T) in each jaw. Total 8.

At one month :—2 central, and 2 lateral incisors (T), and the first and the second molar (T) in each jaw. Total 16.

At six to nine months :—2 central, 2 lateral, and 2 corner incisors (T), and the first three molars (T) in each jaw. Total 24.

At one year:—All incisors and the first three molars temporary, and the fourth molar permanent. Total 28.

At two years :—All incisors and first three molars temporary, and the fourth and fifth molar permanent. Tolal 32.

At three years :—Central incisors, the first, second, fourth and fifth molar permanent; and the lateral and corner incisors, and the third molar temporary. Total 32.

At four years :—Central and lateral incisors, and the first, second, third, fourth and fifth molar permanent; and the corner incisors temporary. Total 32.

At five years :—The horse has a full mouth of 12 incisors, 4 tushes, and 24 molars, all permanent. Total 40. The mare has only 36 teeth, as the tushes are absent or in a rudimentary state.

At six years :—The "Mark" in the central front teeth begins to disappear, and the corner ones are also rubbed only on the anterior edge. The tush is sharp and pointed, and has a distinctly defined edge on its back surface, while it is rounded in front.

At seven years :—The "mark" has left the central front teeth of the lower jaw, and is but slightly defined in the lateral ones. The point and edge of the tush have now lost their sharpness. The rubbing extends to both edges of the corners, also a kind of notch is seen on the corners of the upper jaw.

At eight years:—The "mark" has nearly left the corner incisors. The tush is rounded and its point blunt.

The dental cone is still large and retains its blackness. It sometimes happens that the "marks" remain long after their usual time in the teeth. These may be due to their great depth, or to the animal having been fed principally on soft food. After eight years, the teeth of the horse do not indicate his age with any exactness, and the animal is said to be "aged."

At nine years:—The central incisors show a rounded section with but small remains of the dental cone and beginning to show the dental star.

At ten years:—The same change as above in the lateral incisors.

At eleven years:—The same change as above in the corner incisors.

At twelve years:—All the teeth are round and the central enamel somewhat reduced, and the dental star very apparent thoughout and quite central.

At thirteen years:—Total disappearance of the central enamel.

At fourteen years:—The central incisors assume a triangular form.

At fifteen years:—The laterals become triangular in form. The dental star is quite distinct and round in all incisors.

At sixteen years:—The corners become triangular, and the characters of the above become well-marked.

At Seventeen years:—All the inferior incisors become triangular, their dental star is round, and an interspace now forms between these teeth.

At Eighteen years:—The triangles formed by the teeth, lengthen from before to behind and become laterally contracted.

At Nineteen years:—The tables of the central and laterals are longer from before to behind than transversely, biangular; besides these tables, their lateral borders, converge behind and diverge in front.

At Twenty years:—The teeth are very biangular. The dental arches become narrow and flattened, and meet at a very acute angle.

Beyond twenty years of age the horse is considered as having reached the limit of his life. The characters of the mouth are then those of extreme old age. Sometimes the teeth are too long and too horizontal; at other times, on the contrary, they are altogether too short and worn down to a level with the gums. In all cases only a small portion of the root remains in the alveolar cavity. Viewed in profile, the dental arch scarcely shows more than the corners, and the laterals and the centrals remain hidden by the latter. Viewed in front the teeth are so straight and prominent, that in order to see the inferior incisors, the head must be raised. Wide triangular interspaces, into which pointed prolongations of the mucous membrane as well as brownish food products are prolonged, separate the centrals from the laterals, and the latter from the corners. The tables of friction become more and more flattened upon their lateral surfaces; the dental star shows itself here by a white spot, or in some very old animals by a small cavity, which occupies their centre. The incisive arches are almost effaced, and very narrow transversely. The canines are always very much worn.

CHAPTER VIII.

* SOUNDNESS.

Almost all veterinarians are not unanimous of opinion, as to what constitutes and what vitiates soundness. Even legal authorities who have tried to define a sound horse, seem to differ very much on this subject.

Definition of Soundness.—A horse is sound when he has no disease about him, nor any effect of disease, that renders, or is likely, at any future period, to render him less useful than he would be without it.

Definition of disease.—Any change in the condition of a part, attended with or productive of pain, danger, alteration of structure, deranged function, or inconvenience of any kind.

Definition of Unsoundness.—If a horse has any disease or alteration of structure which diminishes, or is likely to diminish, his usefulness from a working point of view, or if he has any malformation which renders him less than reasonably fit for present work, such a horse is unsound.

Or a horse is **Unsound** when he has about him any disease, or any effect of disease, that renders him at present less useful than he would be without it, or is likely to do so at any future period.

Or in other words, to be **Unsound**, a horse must have a disease, or some effect of disease, and it must be of such a character that, according to the opinion of a qualified judge, it does or will make him less useful than he would be without it.

Practical soundness.—The term "practically sound," although it has no legal significance, may, for convenience sake, be applied to a horse who is capable of performing a fair amount of work, although he may possess one or more defects, which may be open to opinion on that point.

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* Horace Hayes.

This expression is no doubt a very elastic one, and is entirely a matter of individual opinion; and when applied to a horse, means that he is actually unsound, although to a modified extent. Some practitioners employ this term with a view to protect themselves from future discredit. But a veterinary surgeon is bound to pass a horse sound, if he can find nothing in a horse that interferes or is likely to interfere with his usefulness. The gravity of any defect should be decided by taking into consideration the purpose for which the animal is intended, the work he has been doing, his age, and any signs of former treatment. The duties of a veterinary surgeon when examining horses, are to refrain from giving opinion as to conformation, action, price or any other matter, about which he is not professionally concerned.

Warranty is a covenant of security passed between the seller and the purchaser; and those conditions of sale, which relate to the qualities of the horse, form the warranty. A horse might possibly be warranted lame, but when the seller says he warrants the horse, he is understood to say that the horse is sound, and that he will be taken back if he should be otherwise.

The term "**Vice**" is applied to those actions which arise from a perverse or mischievous disposition—those in which the horse opposes his own will to that of his master, or those in which he purposely attempts to injure his companions, or the persons about him. These are not held in law to be a breach of a warranty of soundness, unless they have produced in the animal in question, disease, or alteration of structure.

Blemishes are some unseemly deviations from the original condition of a part, by which the horse's appearance is more or less injured, but not his ability to work. They are not unsoundness, unless they diminish, or are likely to diminish the animal's usefulness, from a working point of view.

Defect is the opposite of beauty and is a physical deficiency more or less serious.

Defects which are absolute unsoundness.

The following is a list of the most common and well-marked defects, the possession of anyone of which would make a horse unsound :—

Asthma or Broken-wind.

Blindness, complete or partial.

Bog-Spavin—A small soft bog-spavin free from signs of inflammation, and one which does not increase in size after exercise, nor affect the animal's action, in an aged horse, may be disregarded.

Breakdown.

Bursattee-ulcers.

Canker.

Capped-elbow.—The mark left after its removal, is not an unsoundness.

Capped hock, Synovial.—It is an unsoundness, because it generally causes lameness, and sometimes abscesses form, on account of caries of the summit of calcaneum.

Capped knee.

Cataract.

Cord, Scirrhous.

Cornea, Opacity of the.—The opacity when sufficiently large and so situated as to interfere with sight, is an unsoundness.

Corns.

Cough.—A cough is not a disease in itself, but a symptom of the presence of some irritation in the air-passages. If the irritation be temporary, and goes away there and then by the act of coughing, it is not an unsoundness.

Curb.

Eye, diseases of the.—*e.g.* Ophthalmia, amaurosis, glaucoma, &c.

False-quarter.

Farcy.

Fistula of the parotid gland.
Fistulous withers.
Glanders.
Grease.
Hernia.
Jaundice.
Jugular vein, inflammation of, or blocking up of the.
Keratoma.
Kumree.
Laminitis.
Lymphangitis.
Mallenders.
Mange.
Melanotic tumours.
Nasal gleet.
Navicular disease.
Neurotomy, effect of.
Ophthalmia.
Paralysis of the lips.
Paralysis of the loins.
Paralysis of the tongue.
Poll evil.
Pumiced feet, as a result of laminitis.
Quidding, this interferes with the process of masticating and swallowing the food, as a result of disease in the mouth.
Quittor.
Rheumatism.
Ringbone.
Ringworm.
Roaring.
Sallenders.
Sandcrack.
Scirrhous cord.
Seedy-toe.
Sesamoiditis.
Shoulders, wasted.
Side-bones.
Sole, weak.

Spavin, bone.—If both hocks are alike, the action perfect, and the power of bending the joints unimpaired, a horse with "Coarse hocks" should be passed as sound. 'Coarse hock' means a hock with well-developed cuneiform bones, giving a prominence to the articulation, very much resembling spavin, and such hocks are found to be superior, standing more wear and tear, and remaining sound.

Sprain of the back tendons, suspensory ligament, or check ligament; or alterations of structure in these parts due to sprain.

Stringhalt.

Thick-wind.

Thorough-pin.—It is regarded of little consequence if without any signs of inflammation, small and not interfering with the action of the animal.

Thrush.

Villitis.

Whistling.

Worm in the eye.—After its removal by operation, or its disappearance, the eye may recover its soundness, provided, if the cornea has been punctured, and the resulting scar does not interfere with the sight.

Defects which are not necessarily unsoundness.

The following defects, unless where specially excepted, may or may not be unsoundness, according to circumstances; such as their nature and position, the age of the animal, and the nature of the work demanded of it :—

Anterior iliac spine, fracture of, or down in the hip. This blemish should be mentioned in the certificate.

Broken knees.—After the wound has healed, it is legally not an unsoundness, but even the slightest mark on the knee, as a rule, seriously detracts a horse's value, so it should be mentioned in the certificate as a blemish. If after giving a full trial, we find no weakness of the

structures of the part, or any other inability, we should not reject the horse.

Brushing or cutting.—Under this comes **Speedy-cutting, brushing,** or **interfering, tread,** and **over-reaching.** They are due to bad conformation, weakness, bad shoeing, and bad action. If a horse is less fit for work on account of this habit, he should be certainly passed unsound, but before doing so, a fair trial should be given for a day or so.

Capped hock.—The capped hock with a serous sac or thickened skin at the point of the hock is not an unsoundness, if not causing lameness. It is generally produced by kicking against some hard substance. It is unsightly, and depreciates the value of the animal.

Cracked or chapped heels.

Contraction of the feet.

Cornea, opacity of.—When so situated as not to interfere with sight.

Crib-biting.—Legally this habit is regarded as a vice and not as an unsoundness. From a practical point of view, it should be considered an unsoundness, as it lessens the usefulness of the animal, requiring special care to prevent him getting indigestion, flatulent colic, &c.

Feet, brittle.—When this condition is a result of disease, it is an unsoundness; but when it is a congenital defect, not causing lameness, it is not so.

Filled legs from work.—If a horse be aged, "filled" or "worn" legs are not unsoundness, provided they do not lessen the usefulness of the animal. There should be no heat or tenderness, and the tendons and ligaments should be clean and without any change.

Firing, marks of.—The Arab and other Eastern horses are very commonly fired, so whenever any marks of firing are noticed, the part should be examined carefully for anything which might go against the soundness of the animal, and if we do not find anything, the animal should not be rejected for the blemish, which must be mentioned in the certificate.

Galls, harness and saddle.

Grunting.—This sound should be looked upon with suspicion, as it generally accompanies roaring and whistling and the animal should therefore be tested for his wind, and if he passes the tests, he may be considered sound. It should be mentioned in the certificate.

Hoof, split.

Ischium, fracture of tuberosity of.—When repair has taken place and if lameness be absent, the animal is not unsound, but the blemish should be mentioned in the certificate.

Parrot-mouth.—This according to its degree, will be an unsoundness or not.

Sore-shins.—If the inflammation has subsided, and the animal does not go lame, it is not an unsoundness.

Splint.—A splint which is well away from the knee, and does not interfere with the working of the suspensory ligament or the tendons, nor with the action of the other leg, is not an unsoundness; provided that it does not cause lameness, and that the horse is at least 6 years old. The forms of splint which are regarded as unsoundness are:—(1) Two splints, one on the outer and the other on the inside of the leg, connected together by a bony deposit. (2) A splint close to the knee, or suspensory ligament.

Wind-galls.—If a wind-gall is soft to the touch, has no signs of inflammation, does not affect the animal's movements, and does not become heated after work, and if the horse is aged, it is not an unsoundness.

Wind-sucking.—Like crib-biting, it is a vice and not an unsoundness, but it is a more serious defect, because it interferes with the usefulness of the animal.

Hereditary Unsoundness.

This includes a list of those defects which show a marked tedency to be transmitted from parents to

offspring. It is very important to know this especially for stud animals, because "like" produces "like". :—

Amaurosis.

Asthma or Broken wind.

Bent fore-legs.—This includes the condition found in some horses of "Standing over" at the knees, and also that of knuckling over at the fetlocks.

Bog-Spavin.

Bone-Spavin.

Cataract.

Contraction of the feet.

Curb.

Glaucoma.

Hoof, defects of the.

Laminitis and its effects.

Navicular disease.

Ophthalmia, periodic.

Pasterns twisted.—This includes toes turned in or out.

Ring-bone.

Roaring.

Side-bones.

Sight, congenital defects of.

Spavin.

Splints.

Thick wind.

Thorough-pin.

Whistling.

CHAPTER IX.

METHODS OF THROWING A HORSE.

There are various processes adopted for throwing a horse, but they may be divided into 3 classes :—(1) **With a simple rope.** (2) **With hobbles.** (3) **By Rarey's method.**

The following rules should be observed in preparation for throwing a horse by either of these methods :—The operation should be performed either on soft ground or on well-made straw bed. The assistants should be told off to their particular work and should pay attention to it only. A strong man should be given charge of the head, with instructions that directly the head comes to the ground he should place his knee just where the head joins the neck, and should bear his weight on this part. He should keep the head placed out as much as possible, and in several methods of throwing, has to be careful not to be injured by the fore-feet of the animal. If the head is kept well down on the bed, the animal cannot possibly attempt to rise, and if the head be kept straightened out on the neck, the animal is not able to struggle much. The **Blinds** may be used when the animal is inclined to be troublesome in having the hobbles put on, which however is seldom the case in India, where the horses are accustomed to heel ropes. A **Twitch** is also sometimes necessary. A proper head-collar not likely to slip off the animal, should always be put on, when a horse has to be thrown for operation. It is a good plan never to throw an animal, immediately after a full feed, and he should be kept fasting for five or six hours previous to being thrown. Mares in foal ought to be thrown very carefully and if possible not at all. It must also be remembered that very old horses have brittle bones liable to be fractured, when the animal is thrown.

The first **Method with the plane rope** should be done in the following way :—Take a rope about **20** yards long and fold it into two, and knot it so as to form a good sized loop, which must be brought over the head and neck and made to fit against the front of the shoulder like a collar, with the knot resting on the breast. The two ends are then brought between the fore-legs, after which each of them is made into a loop around each hind-leg. The end of the rope is then brought towards the head of the animal and passed through the loop in the neck. If the two ends of the rope be now drawn up tight, the hind-legs will be drawn underneath the animal up towards the elbows, and as the animal thus loses his centre of gravity, he may be pushed over on whatever side required for throwing. The hind-legs are then tied in position by the loose ends of the rope, and the fore-limbs are tied with the rope each against the corresponding hind one. The advantages of this method are that it can be carried out anywhere with a simple piece of rope of sufficient length, and without the need of hobbles. It is especially valuable for castration, because both the hind-legs being drawn forwards, the testicles can be easily got at. One disadvantage of this method is that until the fore-feet are tied, the man at the head is liable to be struck unless he keeps the head well up. There are some differences in the way in which the rope is used for throwing. Some place the knot up against the withers, instead of against the breast. Some pass the ends of the rope round the hind limbs from the outer to the inner side, others bring the two ends of the rope between the hind-legs so as to bring them from the inner to the outer side. Always after bringing the ends around the hind-legs, the rope should be twisted on one another to prevent the foot slipping. To let the animal get up again, loosen the loops of the rope simply of the fore-feet first and then the hind. Remember, that before the animal is allowed to rise, if he has the blinds on, they ought to be removed in order that

he may not injure himself in rising, and that he may be able to see what he is doing.

(2) **Method with hobbles** :—At least six men should assist in this process. A hobble should be given to each of the first four. Number five should be the strongest and told off to take charge of the head. Number six should be given the side-line. A horse can be thrown by fewer men with this method but six men should be used when available. The first thing to do is to decide on what side it is necessary to throw the animal, and then he should be brought to stand on the edge of the straw-bed with the side which is to be the uppermost looking away from the bed. Number one has a hobble different in appearance from the rest, known as the **Main, standing** or **king hobble**, to which the chain can be fastened by means of a screw. It is always put on the fore-leg of the side which is to be uppermost. Numbers two, three and four with the ordinary hobbles, put them round the pasterns of the other three legs, while number one puts the standing hobble on the pastern of the upper fore-leg and holds up the foot. He then takes the screw end of the chain and passes it through the loop of number one hobble from without inwards, then through the loop of the hobble of the opposite fore-leg, it is then carried through the hobble loop of the opposite hind-leg, and afterwards from within outwards through the last hobble, it is brought forward to be screwed into or fixed by a screw into number one. In putting on the hobbles, the buckles should always be on the outer side of the limb, then the chain will run through the loops. Directly the chain is screwed on, number six gently passes a loop of the side-line from between the legs to the upper side, and this is passed round number one leg against the elbow joint. Numbers one, two, three and four now take hold of the hobble rope close up against the standing hobble. The two hind-legs should be brought under the body as much as possible, then the rope is drawn up

tightly, the chain slides through the hobble, and all the four feet are brought together, so that the animal stands "all of a heap" with his back arched upwards. Now is the time for number six to be close up to his work. Numbers one, two, three and four should hold the rope up, hand over hand, and in this way, keep close up to the horse. Number one should be prepared, if the chain sticks, to strike the hobble with his foot sharply and violently, so as to loosen the chain and make it run freely again. Directly it is drawn tight, the key should be fixed in the link of the chain which is nearest the hobble number one. The side-line may then be removed. One or two men should continue to hold the rope tightly but not drag it throughout the whole operation, which may then be performed on the animal. Also to keep him quiet, one or two men may rest against his back and hold his tail. While he is down, his nostrils should not be blocked up by the bedding. His wind-pipe should not be pressed upon by an assistant or by ropes. His breathing should not be interferred with by a man sitting on his chest. Another important rule is that no one should get into the dangerous position with the horse, even although he may be down and firmly fastened, because the tackle is liable to give way. It is very frequently necessary for the operator to be in a dangerous position, but he should remain there, and protect himself in every way possible. To let the animal get up again, the chain should be unscrewed, when the hobbles will be loosened.

(3) **Rarey's Method of putting a horse down** :— For this purpose a large area of ground with soft floor is required. The horse must have a single-reined briddle, made short to lie on the withers. A breaking surcingle, made for the purpose with one or two large rings sewed on the belly part, should be buckled round him. Take Rarey's strap specially made for the purpose, pass the tongue through the loop under the buckle so as to

form a noose, slip it over either fore-leg—the near leg in preference—draw it close to the pastern joint, then take up the leg as if you were going to shoe him, and passing the strap round over the fore-arm, buckle as close as you can, to the arm without hurting it. Another strap, also especially made for the purpose, is now looped round the other fore-leg, drawn tight, and passed through one of the rings of the surcingle on the belly. Take a firm hold of the strap, and as soon as the animal lifts his off fore-leg to hop, draw it tight and bring him down on his knees. Thus both legs being secured, pull his head towards you with one rein, bear against his side just behind his shoulder with a steady pressure, and in less then ten minutes the animal will lie down. Thus with a set of Rarey's straps properly applied, one man can alone put down and tie fast a horse. This method is generally adopted for cowing down colts that absolutely decline to be saddled or mounted or do not allow a bridle to be put in his mouth; but when down, he should be strapped up so that he cannot resist, and then by gentle progressive steps, handled and mounted. One precaution must be adopted in using this invaluable expedient of strapping up a fore-leg. After a reasonable time it must be unstrapped, the leg first strapped being vigorously hand-rubbed to restore circulation, otherwise, a horse is likely to stumble with the benumbed limb.

CHAPTER X.

SLANG TERMS.

Carcass—The trunk or body of a horse, and is distinct from the limbs.

Back ribs deep—Last two or three ribs long.

Hollow in the flank—Having depression between the last rib and point of hip.

Pig or crow eyed—Having sunken eyes which look small, and show a good deal of white with lids thick and clumsy.

Long in the rein or neck—Having considerable distance between the bit and the hand of the rider.

Throttle—Throat and its upper part.

Star-gazer—A horse that carries his muzzle much projected, with the head raised up.

Fine withered—One having little muscular substance on each side of the withers. It is seen in well-bred animals and is an indication of good blood. The Arabs have generally thick withers.

Plenty before the rider—Not too short in fore-hand, and having a fairly long neck.

Deep girth—Having a considerable distance from the point of the withers to below the sternum. It is a sign of good breeding.

Up knee action, high action or showy action—Having much flexion of the knee and raising the foot high from the ground. It is considered a good action for harness horses.

Tied in at the elbow—Having the points of the elbows turned in.

Calf or buck knee—Knee bent a little backwards from the straightness of the limb, and the radius inclined a little inwards, so that the knees tend to knock against each other.

Over at the knees—This is the opposite condition of the above and is generally due to hard work.

Standing over—This term is used in two senses by horsemen, *e.g.* the horse may be made to stand over in the stall; and also we speak of the horse standing over the fetlock, when the limb is almost straight at the fetlock.

Knuckling or bending over the fetlock—Flexion or inclination of the fetlocks forwards.

Slack in the ribs, Slack in the loins or **Loosely coupled**—Last rib situated at a great distance from the point of the hip.

Light or short in ribs—Posterior ribs very short.

Ribbed home, well-ribbed, short-ribbed, short-backed, or **closely-coupled**—Having short 'oins' and also the space between the last rib and the point of the hip very small.

Roach-backed—Loins arched upwards.

Coupling up—This is applied to the union of the hind limbs with rest of the body.

Furnished—Fully developed.

A split up horse—One with a deep hollow between the hind-limbs extending nearly to the symphysis.

Goose-rumped—Having round prominent quarters, unusually drooping and the tail set on low.

Second thigh—Muscular part in front of the tibia above the hock.

Going wide behind—Moving with the hind-legs far apart.

Plenty of bone—Having large bones in proportion to the size, especially those of the shanks immediately below the knees.

True or good action—Action which is high, free, and extensive, the ainmal moving steadily, with ease and regularity, setting the foot firmly and almost flatly to the ground, neither turning his toes in, nor throwing his legs out.

Free action—Action with no impediment of movement in different joints, concerned in motion.

Stiff action—Is the reverse of above.

Pitching action—Action in which the fore and hind parts are alternately moved up and down in an even manner, like a ship pitching at sea.

Low action—Action in which the horse does not raise the foot sufficiently high. An animal with such action is also said "to go near the ground."

Daisy tripper or cutter—An animal which does not lift his fore-feet high in action, but keeps them very nearly to the surface of the ground. Arabs go low in their action and are very frequently daisy trippers.

Extensive action—Action in which the horse takes a long darting stride, throwing the feet well forwards and fearlessly.

Confined action—Action in which the animal takes short steps.

Precise action.—Action in which the horse exercises the most perfect control over the feet while they are in the air.

Disordered action.—Action in which the animal's movements are without regularity.

Blood—More or less pure descent from animals mentioned in the English Stud Book, or from high-caste Arabs.

High-breeding.—Having good blood.

Gone in the loins.—Injured in the loins in such a way that the animal has a rolling gait, difficulty in turning, and liable to fall, especially when any weight is put on the back.

Jack.—Bone-spavin.

Groggy.—Affected with lameness of both fore-feet from navicular disease. This action is low and confined, the steps are short, and the foot skims the ground, and the animal goes much upon the toes.

Foundered—Affected with inflammation of the feet, called laminitis. The animal goes on his heels, and the feet undergo change such as pumiced feet.

Broken down.—An accident in which the suspensory ligament is sprained or ruptured.

Gone in back-sinews—Sprain of the back-sinews.

Got a stroke of the wind—Affected with paralysis of loins, especially applied to a form of paralysis known as "Kumree" in India, from the supposition that it is caused by the influence of cold winds.

Wry-necked—Having twisted neck so that the muzzle is bent to one side.

Piner—An animal affected with a wasting disease.

Down in the hip or **hip shot**—Having the antero-inferior spine of ilium or point of the hip fractured.

Going stale—A movement in which the animal loses his trueness of action, in consequence of wear and tear from long continued work, especially seen in animals which are trained for races.

Gummy-joints—Joints especially fetlock and pastern thickened all round, indicating over-work.

Washy-horse—A horse light in the carcass, flat-sided, narrow chested, long in the legs and excitable, so that the least change from the ordinary round of life, will make him purge; such horses are also said to have "**Too much day-light below them**"

Out of form—Want of thorough training or in slight ill-health.

Cur—In racing this term is applied to a horse who will not do his best, but give in at once when he feels a little done up, or when he is hard pressed by other horses running neck to neck.

Ewe-necked—Neck with its upper margin instead of being convex is concave, in consequence of which the animal's head is turned upwards.

Cow-hocked—Having the points of the hocks approaching each other; this condition is very commonly seen in this country, especially among donkeys, in consequence of the animals being put to work from very young age.

Ragged-hip—Having prominent and projecting points of the hip.

Herring-gutted—Having naturally small belly, the animal not being able to do himself well or to make the most of his food. Such animals are generally flat-sided.

Flat-sided or **Flat-ribbed**—Deficient in proper arch of the ribs, and hence narrow in the chest.

Mule-footed or **Steeple-footed**—Having hoofs extremely upright, with contracted heels, and thus resembling the feet of a mule.

Badly-topped—Having the head badly set on, the neck deficient in natural curve, with small imperfectly developed back, and quarters drooping.

Heavily-topped—Having the bones and muscles of the body more developed than those of the limbs in proportion.

Roman-nosed—Having an arched nose, with convexity of the facial line. It is common in low-bred English horses.

Deer or Buck-eyed—Having eyes very prominent and situated far back, so that the animal can see at a great distance behind him like a deer.

Hide-bound—Having the skin dry, and tied as if it were too small for him.

Staring coat—An erect upright condition of hairs, usually an indication of disease.

Jumped-up horse—A horse having a short back, and the fore and hinds legs nearer together, commonly seen in country-breds.

Lop or lob or leaf-eared—Having ears constantly hanging outward on account of deficiency of power of the adductores muscles, as a result of old age or low-breeding.

Over-shot fetlock—Fetlock upright and bulging forwards.

All-abroad—This is applied to a horse when his forefeet fly apart in progression.

Balancing or **Wedging**—A process like that of beaning for concealing lameness.

Bent or **Arched before**—Having the knees inclined forwards.

Bishopping or **Counter-marking**—Making artificial marks on the teeth to make a horse appear younger. This term is named after its inventor called Bishop.

Want of bone below the knee or **Tied in below the knee.**—Having the cannon very narrow immediately below the knee, especially much narrower than at any other part of the same bone; the tendons closely bound to the bone, and the horse apt to want action, and bend over at the knees.

Cleek or click spavin—A Scotch synonym of string-halt.

Clicking or **Forging**—Striking the shoe of the fore-foot with the toe of the hind one during progression.

Comformation, external—Outline of the whole animal, and the relative development and position of the different parts.

Counter—Breast.

Crest-fallen—Crestless neck.

Far-side or **Off-side**—Right side of a horse.

Fiery horses—Horses having an excess of energy.

Figging or **Ginering**—An artful process of applying some irritatant substance into the rectum of the animal, in order to make him carry his tail cocked up in the air, thus confering upon him some appearance of energy or activity.

Light in the flank or **Light-bellied** or **light-carcassed**—Wanting belly, with the flank hollow and tucked up.

Foul or **Foulness** or **Mort**—Glanders.

Full-mouthed—Having a complete set of all teeth.

Gaskin or **Second Thigh**—The space between the stifle and the hock.

Gaunt-bellied—Having the flank tucked up, and wanting in the belly.

Gourdiness—Swelling of the legs, which disappears after exercise.

Hand—A measure equal to four inches, by which the horse's height is calculated.

High-blowing—Uttering a loud, irregular, mixed sound, produced by the flapping of the horse's nostrils, when he expels air quickly from the lungs.

Hoof-bound—Having contracted hoofs.

Interfering, cutting, or brushing—A wound caused by the outer edge of the inner quarter of the shoe or sometimes, by the rough clenches of its nail on the inside of the opposite fetlock.

Long jointed—Having the pasterns long.

Nigh-side or **Near-side**—Left side of a horse.

Nicking—Cutting the depressor muscle of the tail, the stump being spared.

Docking—Amputating a portion of the stump of the tail.

Banging—Cutting the hairs of the tail.

Over-reaching—Striking the heels or pasterns of the fore-feet with the toe of the hind-foot.

Whistling or **Piping**—Producing a loud and whistling noise, on account of contraction of the orifice of the wind-pipe.

Puffing the glims—A kind of fraud to fill up the hollows over the eyes when they are very deep, by piercing small holes in the skin, which lines the cavity and blowing a little air into them. It takes away much of the aged cast of the countenance.

Wall-eyed or **Ringle-eyed**—Having the iris of almost white or grey colour.

Screw—A worn-out horse.

Shown in hand—When the horse is led before the purchaser.

Short-jointed—Having the pasterns short.

Soft horse or made up for the market or out of condition horse—A horse not in working condition.

Speedy-cutting—A wound produced on the inside of one fore-leg near the knee by the other fore-foot, when a high-actioned horse is trotting fast.

Clinked in the chine or shook in the loins or swayed in the back—Suffering from half-palsied state of the hind-legs.

Thick-winded—Having difficulty of breathing.

Tottering—Trembling of the fore-legs, observed in some horses after exercise, and especially in those that are bent at the knees, or have upright pasterns.

Weed—Ill-made worthless horse.

Wind—Power of breathing.

Barrel—The part of the body between the shoulders and the haunches, and includes the back, loins, belly, flank, and some of the ribs.

Stand well up before—Having high withers.

Ham-strung—Having the tendo-achillis or ham-string tendon cut off.

Good-mouthed—Having a mouth not too tender, but sufficiently callous to endure a pull of the rein or bridle.

Soft or tender-mouthed—Having a mouth very tender for the pull.

Hard or thick-mouthed—Having a mouth very callous or hard for the pull.

Habit—Unusual and harmless peculiarity in conduct *e.g.* weaving, pawing, tearing off the clothes, &c.

Fault—Everything objectionable, whether existing in shape, age, colour, temper, action or any other quality.

Standing at attention—Is a position of a horse when he stands with head and neck raised, ears pricked forward, the profile of the face at an angle of about 45° to the ground, and at about a right angle to the crest; the weight proportionately distributed on all four limbs, and the fore and hind-foot on a level with its fellow.

Standing "collectedly"— A position which a horse assumes when he makes ready to move quickly away from the place in which he is standing. His hind-feet will be well in front, his fore-feet will be brought back more than usual, his head and neck will be raised, and he will be looking to his front with his ears pricked forward.

Standing at ease—Is a position in which both fore-feet are equally advanced to bear the weight, his head being lowered, and one hind-limb is rested by its joints being bent and its heels raised, while its fellow supports the weight of the hind-quarters. When the supporting-limb becomes tired, the other one takes its turn of work and so on.

Carriage of the head and neck.—The attitude which the head and neck assumes.

Hollow or saddle backed.—Having a concave condition of the back.

Brisket.—Lower part of the chest.

Dishing.—Throwing of the feet outward, and crossing the legs when raised off the ground in trotting.

To strike out.—To kick.

Cow-kick.—A forward kick with a hind-leg.

Game-cock throttle.—Having throat like a game-cock, with wind-pipe large and well detached from the neck, with a good forward carriage of the head, indicating good breathing power.

Hand-gallop.—A smooth style of canter, which approximates somewhat to the gallop.

Handiness.—Cleverness. It depends upon the conformation, disposition and training.

Hinny or Jennet.—The produce of the horse and the she-ass.

Mule.—The produce of the jack-ass and the mare.

Both the mule and the jennet respectively "take after" their dam in size, and their sire, in appearance and disposition. Neither of them is fertile, either among

themselves, or with other members of the horse-family. They are hybrids between the horse and the ass.

Tied in below the hock—Having the head of the cannon bone and the cuneiform bones small, a conformation that presents a small surface over which concussion has to be distributed. It gives the hock a short and weak appearance. Such hocks are naturally subject to spavin.

Sickle-hock—Hock which remains bent to a marked degree. It is objectionable in any kind of horse.

Straight dropped hind-leg or **Hock well let down**—Having the leg straight from the stifle to the fetlock.

Hogging the mane—Cutting short the hairs of the mane.

Coarse or large hocks—Having the cuneiform bones large, so that both hocks look equal and large. This shape is the one best adapted for diminishing concussion.

Jibber—A horse having the vice of refusing to go in harness.

Kink in the tail—Twist in the tail.

Water mark or Quarter mark—The line of separation between the biceps rotator tibialis muscle and the abductor femoris. It must be clearly apparent, indicating an absence of fat about the part.

Passage—A French word, signifying a short and very high trot in which each fore-limb, in its turn, when it is raised to its highest point, is poised in the air for an instant, and is bent at the knee and fetlock.

Rat-tailed horse—Horse having a tail devoid of hairs.

Staying power—Ability to endure fatigue and "stay" a distance. It depends on (1) The breathing power being good. (2) The muscles working to advantage, and the conformation being of the required kind. (3) The action.

Stride—The distance from the foot-print of any one leg to the foot-print of the same leg, when it next comes to the ground.

Step—The forward or backward movement of one foot; or it is the distance when one foot is removed from its fellow.

Bounding or Skipping—Complete elevation of the body above the ground by the successive and alternate raising of the anterior and posterior parts of the body.

Bucking or **Goat-leap**—Almost identical with the preceding. It only defers from skipping in that the animal appears to elevate simultaneously the four legs, and touches the ground again in the same manner.

Capellet—Capped hock.

Bow legged hock or **Hock arched outwards**—Having the curvature of the hock external to the line of axis with great separation of the calcanea. It is also accompanied by convergence of the hoofs in front.

Horse closed in front or **Knock-kneed**—Horse having closeness of the fore-limbs and deficiency in the width of the chest.

Too open in front—Having the fore-legs, as a whole, outside of the vertical line, and the space between the hoofs more considerable.

Coom—The secretion of a sebaceous nature, and of a strong and disagreeable odour from the preputial glands.

Cover or check the steps—The imprints of the hind-feet superposing on those of the fore-feet.

Ill-check or ill-cover the steps—The hind imprints falling short of the fore ones.

Over-cover or over-check the steps—The imprints of the hind-feet falling in front of the fore.

Decubitus—Lying down.

Dry-spavin—String-halt.

False-nostril—A cul-de-sac or pouch lined by skin situated at the inner wing of the nostril.

Flying trot—Fast trot.

Fraying of the axilla—Excoriations accompanied by redness and great sensibility found in the folds of the skin of the axilla.

Garniture—Edge of the shoe projecting beyond the wall.

Halter-cast.—A transverse or oblique wound produced in the hollow of the pastern by the friction of the strap fastening the horse to the manger.

Leprous spots.—Spots due to absence of cutaneous pigment, or discoloration. They are generally found around and in the interior of the natural openings, as mouth, eyes, nostrils, anus, &c.

Moor-headed.—Having the head much darker than the rest of the body.

Mounted upon matches or **Parched high** or **wiry horse.**—Horse having very long and thin legs, which are disproportionate to the body.

Mule ray, or **stripe**, or **list.**—A dark or black stripe which extends upon the medium line, from the withers to the root of the tail.

Paddling.—The action in which the animal throws his feet outside the plane of movement of his members.

Pedigree.—Origin or genealogy. A horse whose genealogy has been entered in the Stud-Book is said to have his pedigree "traced."

Pegged shoulders.—Having shoulders, although normal in appearance, seeming to be restrained from acting with entire freedom.

Pincard or Rampin foot.—Having a foot touching the ground only with the toe.

Pissy.—A mare in whom the condition of heat or œstrum is habitual.

Pointing—Advancing a limb from its vertical axis, and resting it on the toe or holding it in the air.

Proportion—Agreement and co-relation of different parts of the body of an animal.

Avalure—Normal descent or growth of the horn of the hoof.

Rammy foot—Foot having circles all round the wall due to altered nutrition of the caronary band.

Rearing—An attitude in which the fore-part of the body, raised above the ground, is maintained in equilibrium upon the posterior limbs.

Kicking—An action opposite to that of rearing. The animal elevates his hind-quarters upon the fore-quarters and forcibly throws the two posterior limbs backwards.

Shoe-boil—Capped elbow.

Short-winded or Panting—An animal who remains "winded" a long time after exertion.

Skittish horse—Horse who frets and worries for the least noise, or one who is afraid of his own shadow or of an object which surprises him.

Soot-balls—Corpora nigra or black bodies suspended from the edge of the pupil.

Sorrel—A colour consisting of golden and reddish-brown hairs, resembling the colour of cinnamon bark.

Square horse—Horse whose height at the whithers is equal to his length, and which therefore might be inscribed within a perfect square.

Attitudes—Diverse positions which the horse assumes when at rest, either standing or recumbent.

Station—An attitude of the animal standing almost motionless, and touching the ground with his four legs, or with three of them only.

Sway or saddle back—Having a hollow or concave back.

Switching the tail—Jerking the tail.

Zebra marks—Black lines directed transversely upon the regions of the fore-arm, leg, knee, hock and cannon.

Race horse—A running horse who is always ridden upon the race-course at a fast gallop *i.e.* upon chosen ground, almost flat, and never presenting obstacles to be leaped over.

Steeple-Chaser—A variety of horses which only appear in races in which obstacles are to be leaped over.

Coach-Horses—Horses which were used in the vehicles called Coaches; but now they are used to all carriages of luxury, in pairs or single, according to circumstances.

Hackney—A saddle-horse of pure luxury, which is reserved for the promenade and for display, and put to no other use.

Cob—A horse of luxury for driving or riding, which is used as a saddle-horse for persons of heavy weight and which may, besides, be employed as a driving horse for light carriages

Hunter—A horse exclusively designed for hunting. His principal characteristics are those of galloping and leaping over obstacles.

Pony—The smallest horse of luxury and is especially adapted to children's use. When harnessed, he is driven to all sorts of small vehicles.

Staff horses—Horses reserved for the remount of the corps officers.

Troop horses—Horses, which constitute the principal part of the cavalry.

Cavalry horses—Horses used for military troops.

Artillery horses—Horses used to drag guns.

Beaning—Inserting a small piece of iron or other substance, resembling a bean in form, between the shoe and the sole of the sound foot. This is a dodge to make a lame horse go level, or as lame on the sound limb as he is on the diseased one.

Clipping—Cutting the hairs of a horse by a clipping machine.

Pumiced foot—A flat or convex condition of the sole.

Round bone—Hip-joint.

Circled or bordered eye—Eye in which a portion of the sclerotic around the edge of the cornea is visible through the palpebral opening.

Lolling the tongue—Protruding the tongue from the mouth and becoming pendulous.

Coarse or gross head—Head defective from an excess of all its dimensions, owing to its volume and great development of bony framework.

Senile or Sharp head—Head emaciated from atrophy and absorption of fat and muscles.

Martingale—A strap of leather extending from the bit to the girth of the saddle. It prevents rearing, and enables the animal to keep the neck in an arched position like a swan.

Greyhound-like belly—Having the inferior line of the belly describing a graceful curve, passing obliquely backward and upward.

Dropping, Pendudous, Pot, or Cow's belly—Having the inferior line of the belly very convex and descending abruptly downward from the sternum.

Over in the Knees or **Knee-Sprung**—Knee curved forward.

Sunken, Hollow or **Sheep-knee**—Knee deviating towards the back of the vertical axis.

Pigeon-toed—Having the toes turned inward.

Foal's Cramp—Dislocation of the patella.

To have weak pins—Have fetlocks deficient in width and thickness.

Pricking—Penetration into the sensitive tissues of a nail which is driven too closely by the farrier.

Ox-knee—Knee convex internally, with an outward deviation of the toe.

Under himself behind—Having the hind-limbs placed obliquely downwards and forwards, instead of being vertical.

Camped behind—Having the axis of the hind-limbs situated behind, and is the reverse of that in the preceding conformation.

Too open behind—Having the Hind-limbs, as a whole, situated outside the vertical line.

Bow-legged—Having the hocks situated outside the vertical line.

Crooked-legged—Having the hind toes situated outside the vertical line.

Closed behind—Having the hind limbs, as a whole, deviated inward from the vertical line.

Close-hammed or **Cow-hocked**—Having the hocks deviated inward from the vertical line.

Cross-footed—Having toes deviated inwards from the vertical.

Gait—A diverse mode in which progression is accomplished by the play of the locomotory members.

Beat—The sound produced by a foot when coming in contact with the ground.

Contact—The time during which a foot remains in contact with the ground.

Track—The succession of imprints indicating the character and direction of the gait.

Imprint—The trace left upon the ground after the contact by the foot which is rising.

Walk—A slow gait, with four beats, in which the legs associated in diagonal bipeds, are elevated and rested successively.

Trot—A fast gait, with two beats, characterized by the simultaneous raising and resting of the diagonal bipeds.

Amble—A fast gait, marched with two times, and characterized by the simultaneous raising and resting of the lateral bipeds.

Canter—A trot in which the beats of one of the diagonal bipeds is disassociated instead of remaining simultaneous. It is said, in this case, that the horse gallops in front and trots behind, and *vice versa*.

Gallop—A fast gait, with three beats, and leaped, in which the synchronous beats of a diagonal biped are interposed between the successive beats of the opposite diagonal biped, which begins the step by its posterior member.

Backing—Walking backwards.

Leaping—A progressive movement in which the body is completely separated from the ground to be projected forward and upward by the sudden impulse given by the four limbs.

Balky horse—Horse who refuses to obey the command of his driver or rider, or refuses to go in the desired direction.

Lameness—The manifestation in the act of progression or while standing, by one or more of the limbs, of pain, weakness, inability, or impediment.

Barnacles—The application of pressure by means of the handles of a pair of pincers inclosing the muzzle, and held firmly. They are not, however, so useful as the twitch.

A "hit" in breeding—An instance of success.

In-and-in breeding—The pairing of relations within the degree of second cousins twice or more in succession.

Out-crossing—The pairing of those which are not at all allied in blood.

Charger—A horse used by an officer at the time of attack.

Trooper—A horse used by a soldier at the time of attacking.

Shouldering—An attempt to crush the leg of the rider against a wall, which some ill-tempered horses are fond of doing.

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ERRATA.

Page 28, line 27, for *parallysed*, read *paralysed*.

„ 30, „ 13, „ *Bits*, „ *Hits*.

„ 46, „ 1, „ *lmost* „ *almost*.

„ 47, „ 36, „ *exretion*, „ *exertion*.

„ 55, „ 8, „ *glaos*, „ *glans*.

„ 56, „ 12, „ *insert*, „ *inserts*.

„ 76, „ 2, „ *cathetar*, „ *catheter*.

„ 118, „ 20, „ *from*, „ *form*.

„ 131, „ 38, „ tedency, „ tendency.

„ 136, „ 31, „ briddle, „ bridle.

„ 149, „ 21, „ genealogy, „ geneology.

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